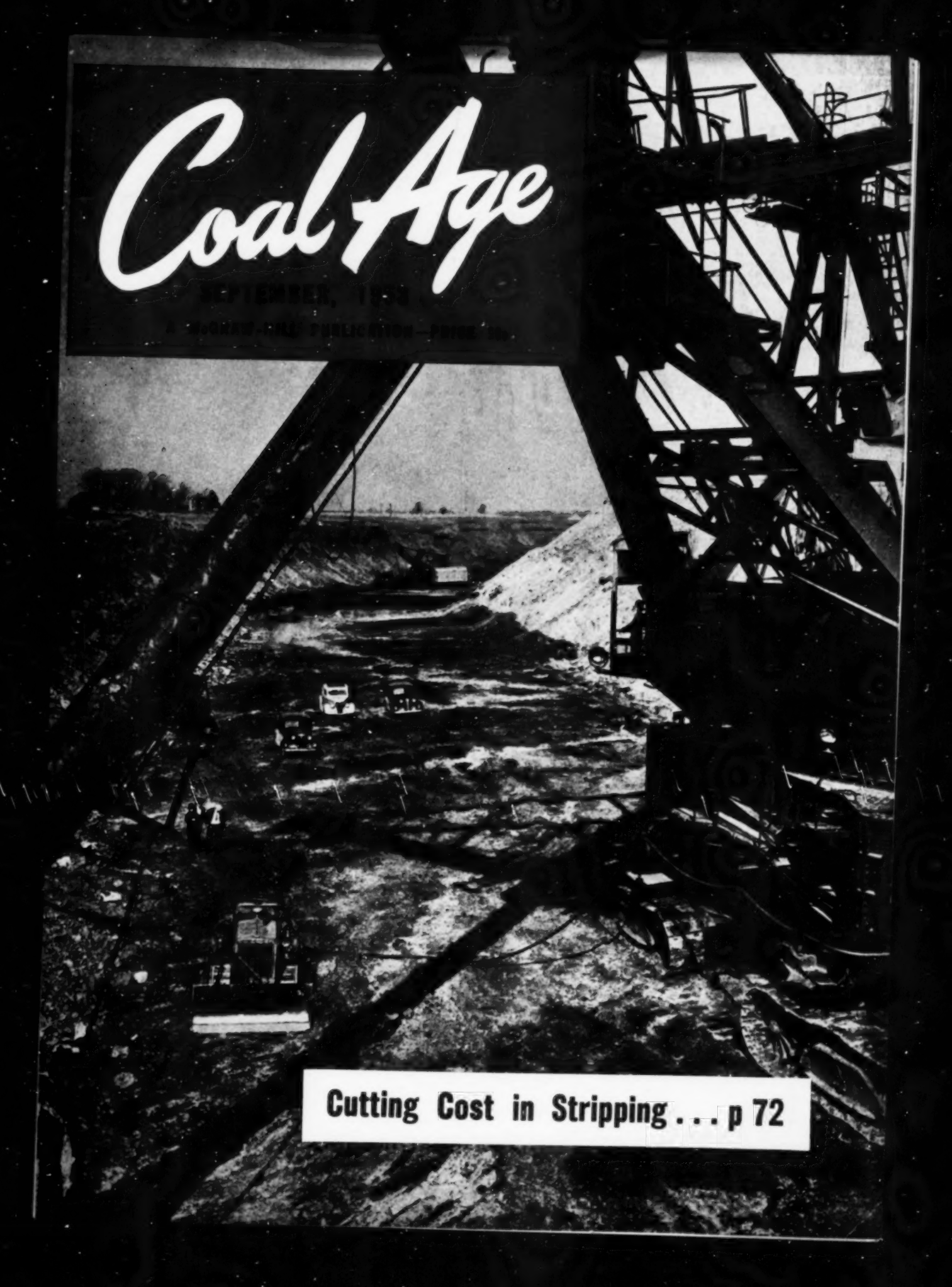
Coal Age

SEPTEMBER, 1953

A McGRAW-HILL PUBLICATION—PRICE 75¢



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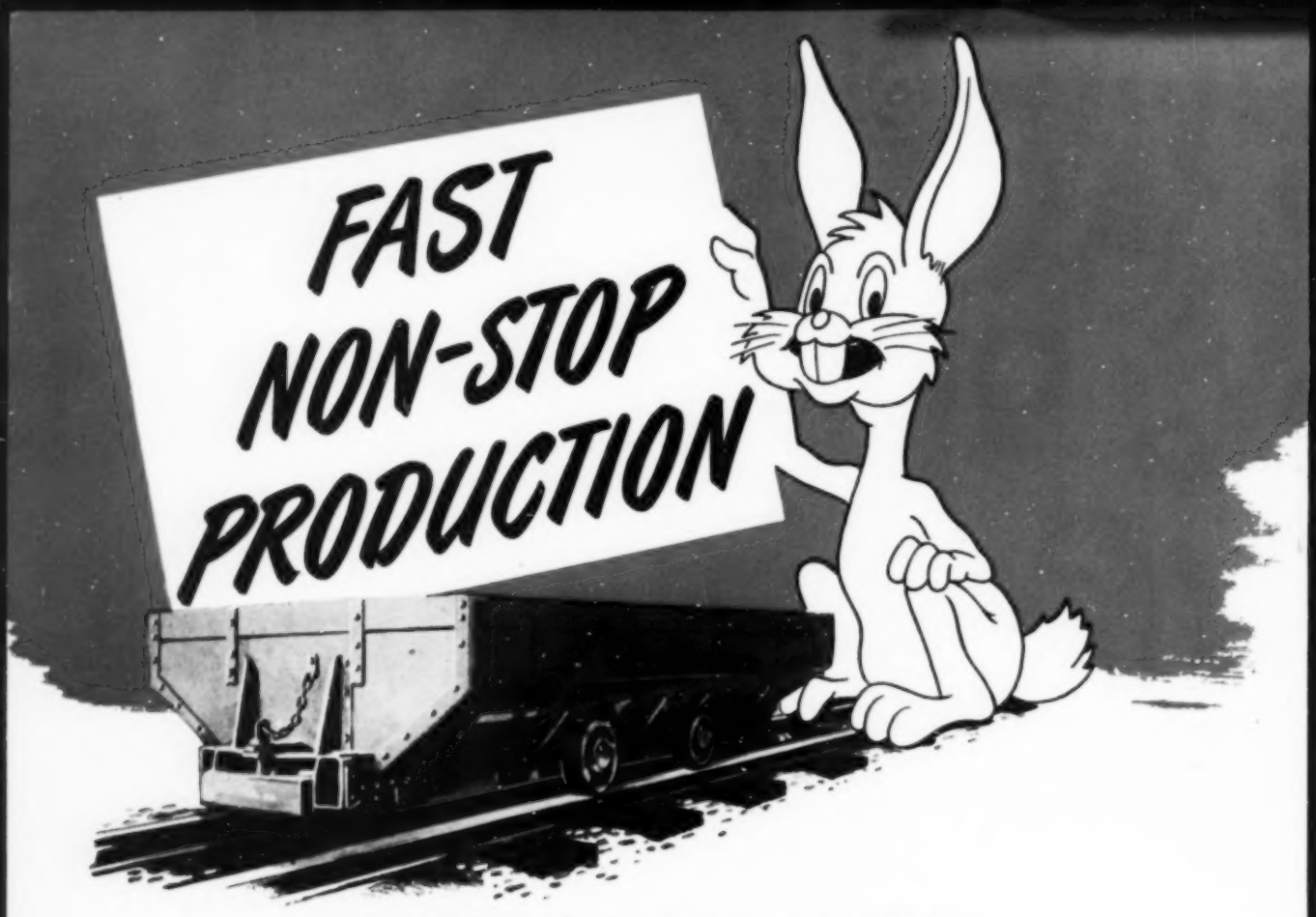

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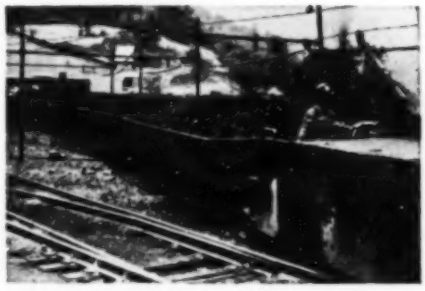

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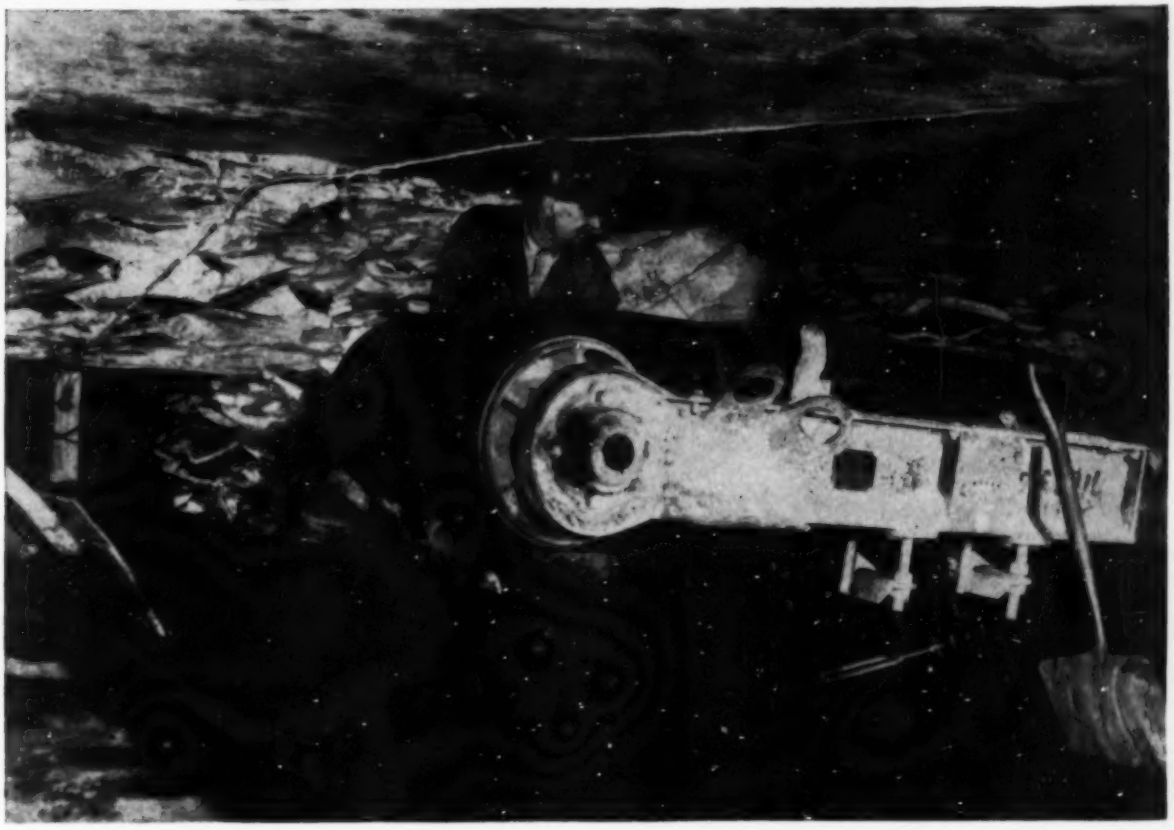

B. F. Goodrich cord belt troughs to fit light or heavy loads

A CONVEYOR belt should trough naturally under light loads as well as heavy. Otherwise the belt loses complete contact with the idlers and runs off center, wears along the edges. Costly belt damage results.

In the B. F. Goodrich *cord* belt these problems have been eliminated. There's a ply of parallel cords, running lengthwise, built into both the top and bottom of the belt. Each cord is completely surrounded by rubber—no cross threads tie them together. There being no crossweave in the cord plies, the cord belt is more flexible, and so troughs and tracks perfectly whether empty, lightly or fully loaded. (See small picture at left). Spillage is reduced, belt keeps centered on idlers, requires less maintenance.

The B. F. Goodrich cord belt shown above had been in use six years when the picture was taken, and is in such good condition, engineers predict it will give years of additional service. While it only handles 65-100 tons-per-hour, troughing is natural; there's been no maintenance due to edge wear.

Natural troughing is just one of the reasons B. F. Goodrich Caricoal cord belts last longer, serve better. Other construction features provide high impact resistance and double protection against mildew. So before you place your next order for belting, let a BFG distributor show you how these longer-lasting conveyor belts can cut your coal handling costs, or send for the free booklet describing the B. F. Goodrich Caricoal line of conveyor belts.

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William Penn is not alone among Philadelphians whose word is never broken . . . you can take our word for it for what we tell you about Hulburt Quality Grease. And what we have to say is simple. It's just that this specialized Grease, being made since 1861 for *one purpose only*, will do a perfect job of lubrication on coal mining machinery. We have never made or sold it for anything else—that's why it's famous, that's why it's way ahead in performance. You owe it to your valuable machinery to use Hulburt Quality Grease.

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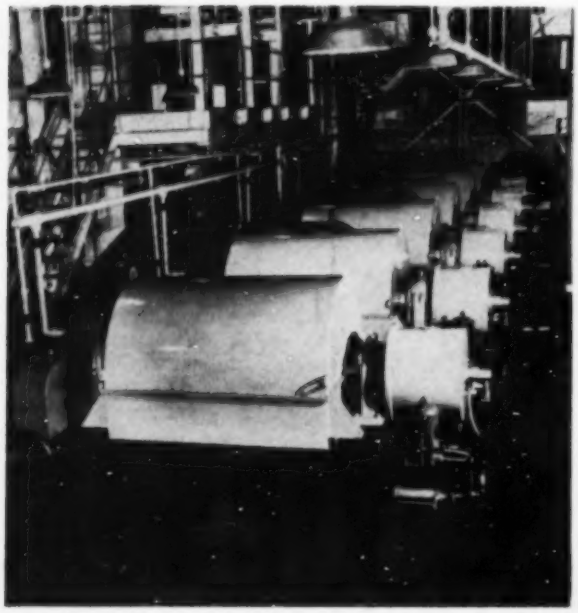
Specialists in Coal Mine Lubrication

This Is The Best Way To Dewater Your Fine Coal



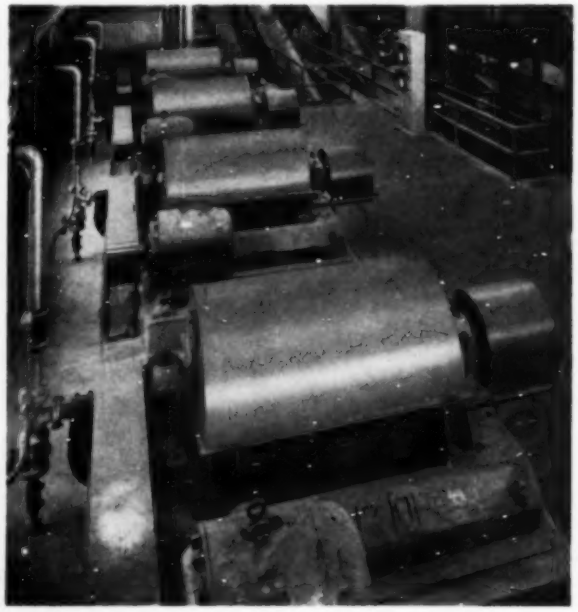
You get your ⅜"x0 fines uniformly dry for direct loading or thermal drying.

The extra fine, high ash particles can be separated from the clean coal, reducing moisture content as much as 50%.

One Bird dewaters up to a ton or more a minute — operates for seven cents per ton including power, labor, amortization and maintenance.

The BIRD COAL FILTER

This Is The Best Way To Clean Up Your Coal Cleaning Water



Fine particles including colloidal size clay are treated with flocculants in a simple, inexpensive system; then the Birds whisk out all the slimes and deliver them to refuse.

The water overflowing the settler is polished up so crystal clear that it can be continuously recirculated.

The sludge pond nuisance is done away with. No more pollution problems.

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Coal Age

SEPTEMBER • 1953

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NEXT MONTH . . .

"Mystery Market"

MANY COAL MEN consider "Other Industrials" to be to some extent the "mystery" member of the coal-consuming market. Intrigued by this group, *Coal Age* editors recently set out to study these users and their requirements, determine what is happening to their tonnage, and why. What we found will appear in the leadoff feature in the October issue, along with an analysis of the opportunities in this field and how they can be realized. Perhaps in this article you may find a tipoff on how you can mine, prepare and sell more coal to this type of consumer.

High-Capacity Stripping

WHAT'S BEHIND the record of 1,522,154 yd stripped by one shovel in a month? Men, management, methods and equipment — properly coordinated—are the keys to efficiency and cost in practically any operation, and that certainly is true at the Georgetown No. 12 stripping in Ohio, where this record was set. A *Coal Age* editor recently visited the Georgetown property for the sole purpose of ferreting out the basic reasons for this outstanding performance. His findings, scheduled for October, cover the basic approach, modifications in methods, improvements in equipment, engineering and management-employee teamwork.

Installing 555,878 Bolts

BETTER ROOF CONTROL, elimination of accidents from handling or dislodging timbers and recovery of 7 to 10% more coal in pillar extraction are among the benefits credited to roof bolting at a property of the Bethlehem Mines Corp. You'll find plenty of meat in this report of over 5 yr of progress in roof-bolting methods and materials, including successful bolting of 138.42 mi of entry with no major failures.

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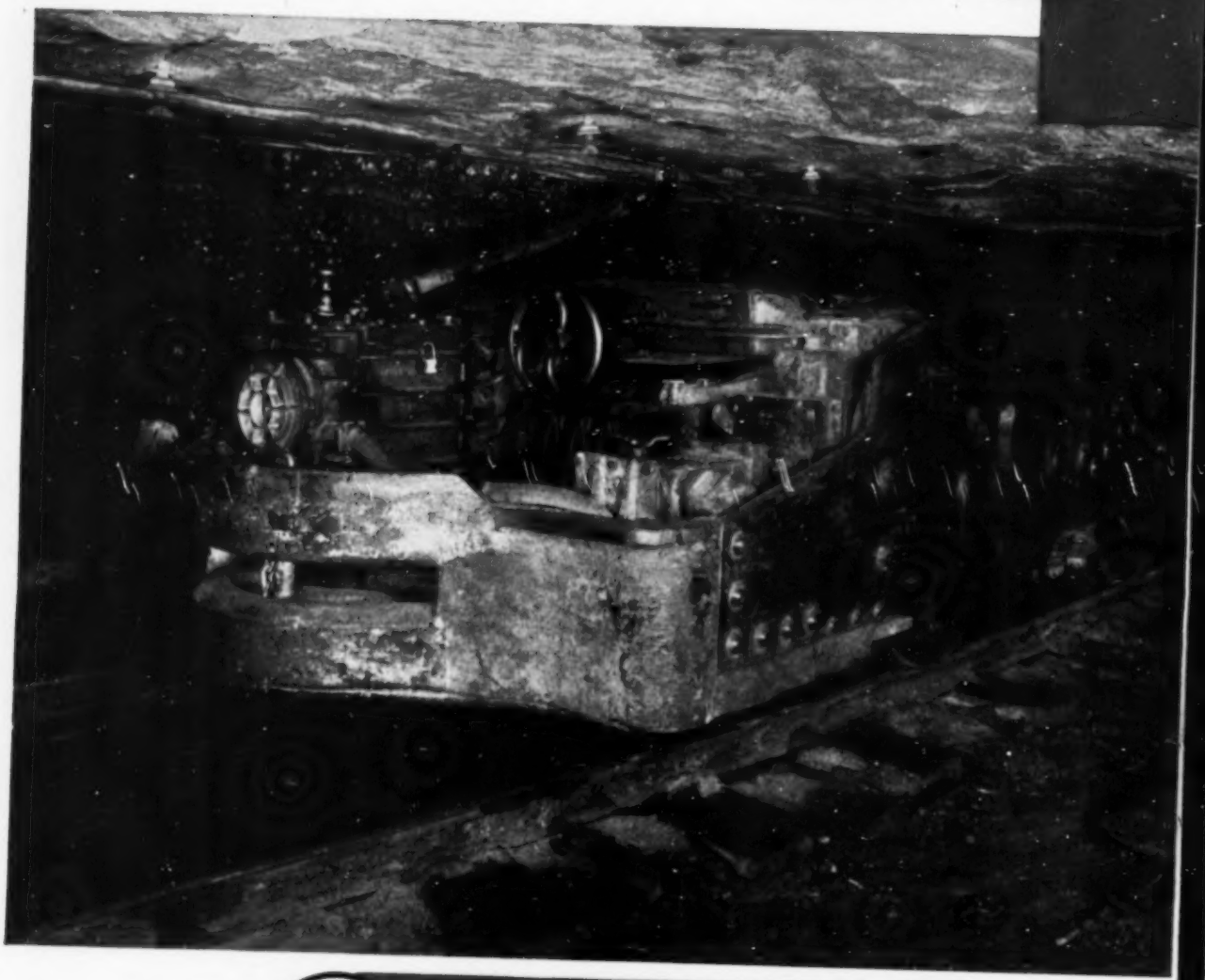

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TO REDUCE COST of bearing maintenance

Stop-motion photography proves how well *Texaco Regal Starfak* protects high-speed, anti-friction bearings. When the picture at top of opposite page was snapped, bearing was revolving at 3,750 rpm and grease temperature was above 250° F. See how *Texaco Regal Starfak* stays in the bearing, completely protecting moving parts.

You can count on this same fine protection for your high-speed, grease-lubricated ball or roller bearings when you use *Texaco Regal Starfak.* It's the kind of protection that spells better performance, longer bearing life, lower maintenance costs.

Texaco Regal Starfak is premium-quality — much higher in resistance to oxidation, separation and leakage than ordinary greases. It retains its stability in storage as well as in use . . . is heat resistant and can be used at high operating temperatures.

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To protect wire rope and open gears, the lubricant to use is *Texaco Crater.* It keeps your rope strong longer; assures smoother, quieter gear operation. If you prefer the convenience of liquid application, use *Texaco Crater X Fluid.*

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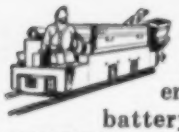
LUBRICANTS for the Coal Mining Industry

INSIDE AN EXIDE-IRONCLAD



Inside . . . where it counts most . . . EXIDE-IRONCLAD is entirely different than any other battery. It's made that way by EXIDE'S exclusive IRONCLAD slotted-tube construction . . . a principle that provides direct operating-hour savings for you.

OF *ALL* BATTERIES, ONLY EXIDE-IRONCLADS HAVE POWER TUBE POSITIVES

The positive plate is different . . . unique . . . exclusive. It is the most effective retainer of active material yet demonstrated in heavy duty service. Slotted tubes contain the active material. So fine are the slots that, while permitting easy access of electrolyte, they retard the active material from washing out, hold it during repeated cycles of charge-discharge, and the vibration of rough use.

Today's battery-powered equipment is being used harder than ever before. Unless the batteries have internal shock protection they tend to deteriorate under hard usage—both electrical and mechanical. Only Exide-Ironclad has the plus-protection of the tubular positive that can withstand today's more exacting and rigorous heavy-duty battery services.

Your EXIDE sales engineer will give you the factual inside story. See for yourself why *only* an EXIDE-IRONCLAD gives maximum day-after-day service under the most difficult operating conditions . . . *with a minimum of maintenance expense.*

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

1888 . . . DEPENDABLE BATTERIES FOR 65 YEARS . . . 1953

Cross section shows relation of positive plate to separators and negative plate. Note the much greater exposure of active material to electrolyte as compared with that of the usual flat positive plate. This greater exposure makes possible the high power ability and uniform-voltage characteristics of the Exide-Ironclad. The negative plates have been made extra heavy to balance the increased capacity of the power tube positives.

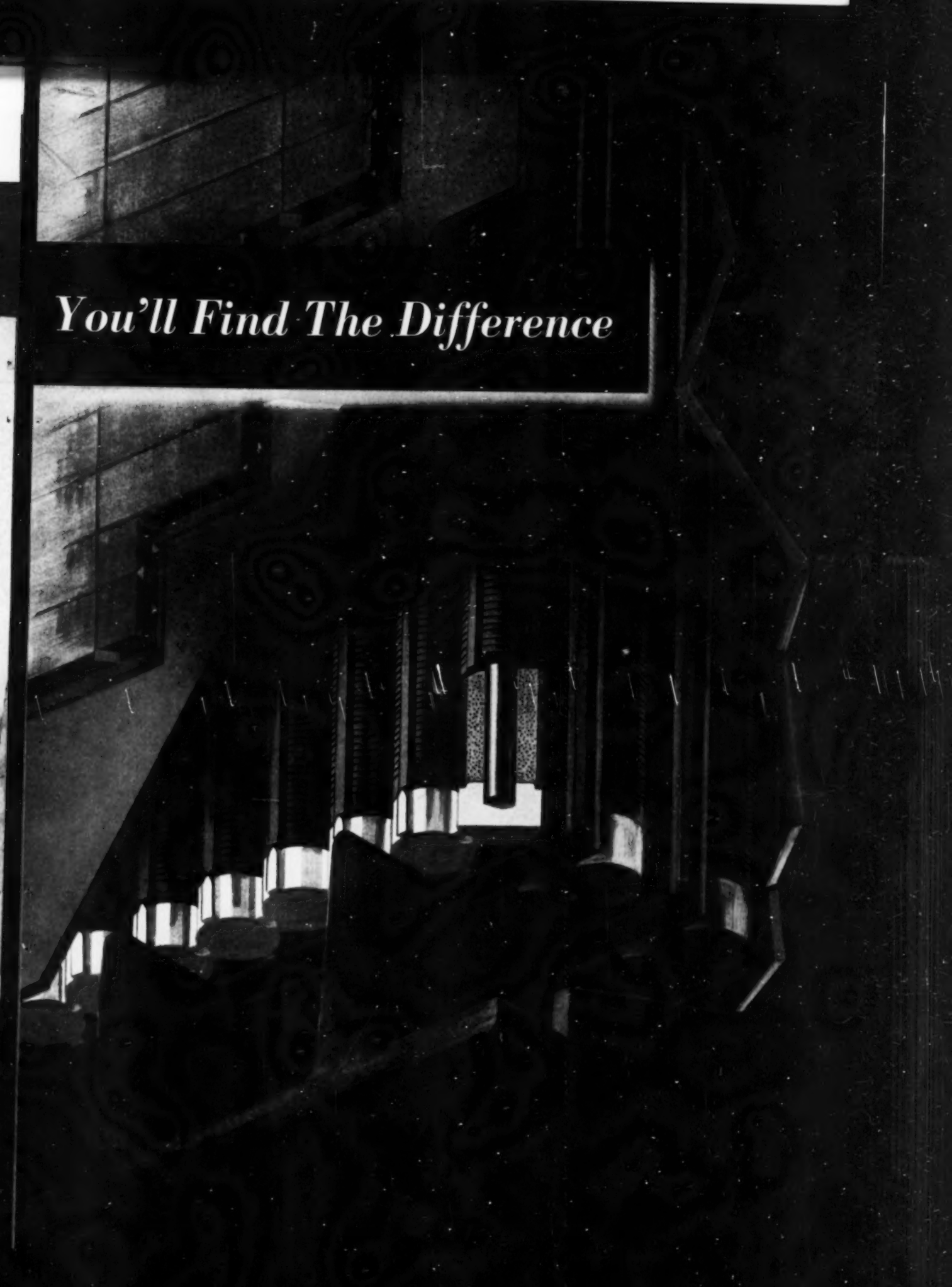
Running through center of each tube is an alloy core which is cast with the heavy top cross bar. These form the sturdy, non-buckling grid. Both core and top bar are made of Exide's new corrosion-resistant Silvium, an alloy of silver, lead and other components, which adds greatly to plate's long life.

New polyethylene insulating tube sealer of acid-proof, non-corroding plastic fits snugly into bottom of slotted tubes and further reduces loss of active material. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.

Exide-Ironclad

YOUR BEST POWER BUY . . . AT ANY PRICE

†"Exide-Ironclad" and "Silvium" *Reg. T.M. U.S. Pat. Off.*


You'll Find The Difference

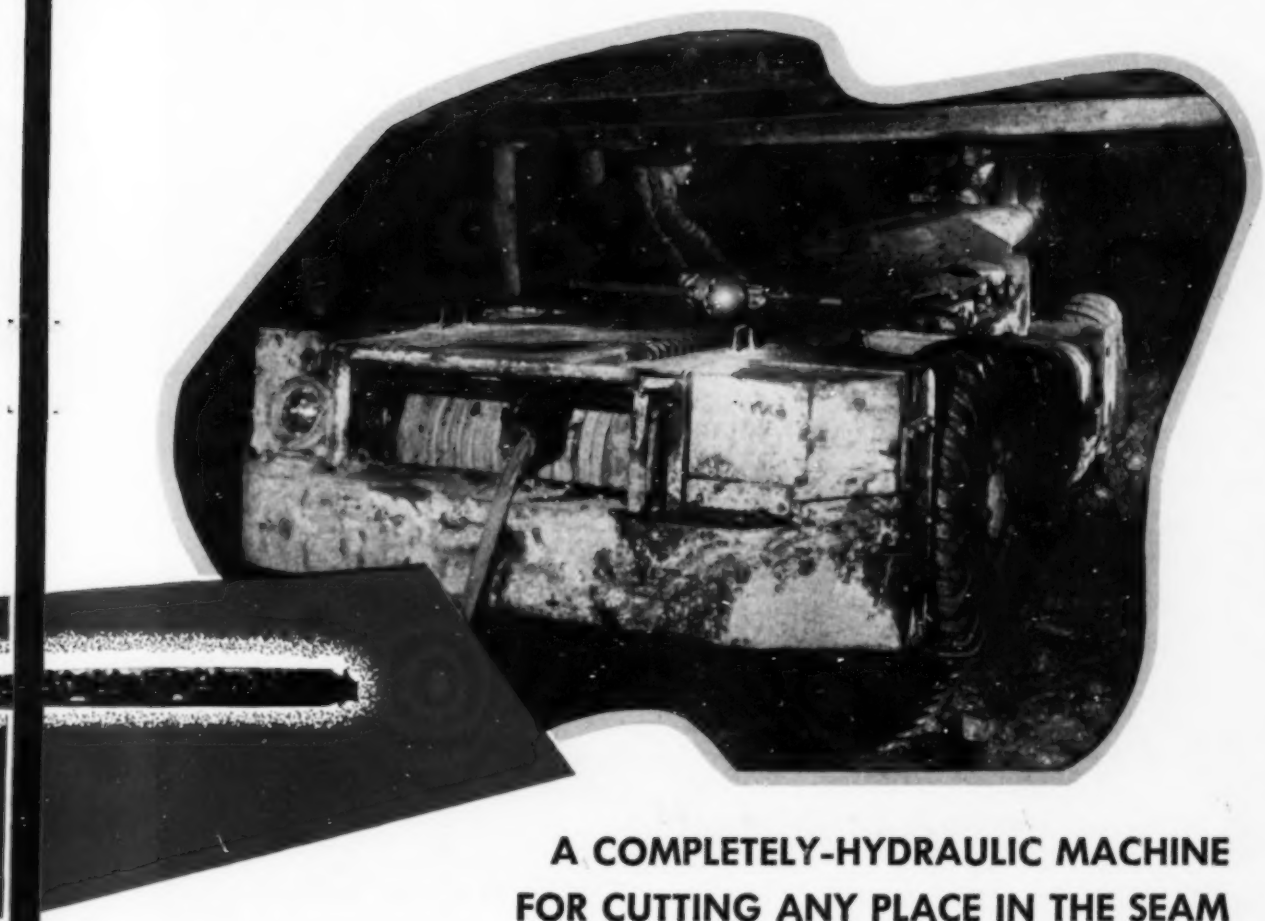
Cut both Coal and Costs with this *seasoned*

JEFFREY

70-UR UNIVERSAL CUTTER

This type of coal cutter is proving itself daily on those operations requiring a machine capable of making a variety of cuts—in a minimum of time—at low cost. Consult a Jeffrey engineer for additional data on this truly universal machine.

Available in 5 Models.
Cutting range—11″ below floor to 13′ above.
Minimum tramming height—30-45 inches.
All are compact, rugged and speedy in operation.



A COMPLETELY-HYDRAULIC MACHINE FOR CUTTING ANY PLACE IN THE SEAM

Here's a machine that can make any kind of cut any place in a coal seam. From one position it can make a 30 ft. horizontal cut or make a shearing cut 5'5" either side of center line of machine. Maximum top cutting height of a standard unit is 7'9". However, with a special high-type machine a top cut as high as 13 feet can be made.

All operations are hydraulically actuated (except driving cutter chain). This insures a quick, positive and accurate response — saves time — and results in greater tonnage per man day. Another feature which makes for ease of operation and time saving is the dual control. Both sides of the 70-UR are identically equipped with controls permitting operator to position himself for either right or left hand cut and still have complete control of all operations at his finger tips.

The Jeffrey 70-UR is mounted on pneumatic tires and equipped with hydraulic steering. It can be maneuvered with exceptional ease regardless of floor conditions. The wide wheel gauge, adequate wheelbase and low center of gravity combine to give excellent stability and equilibrium even when operating at extreme reach.

We will be glad to tell you more.

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IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

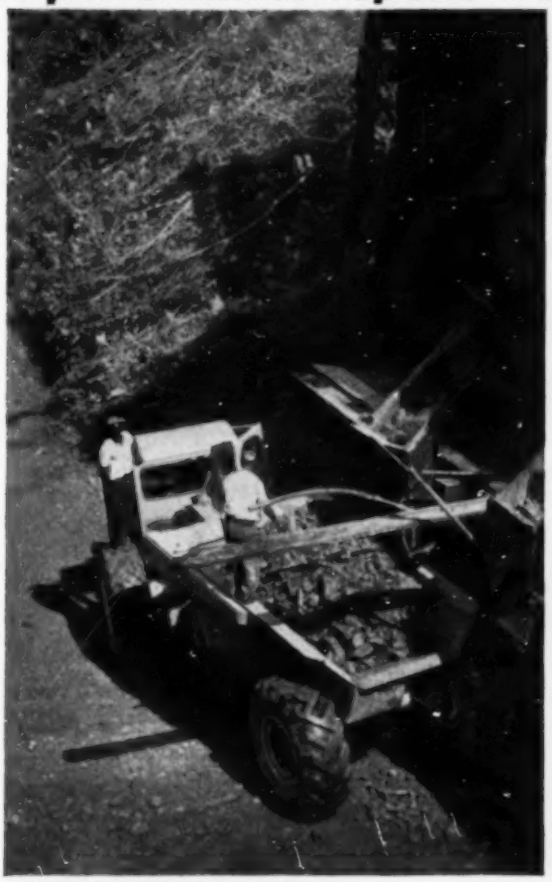
Pictures of the month... by LeTourneau-Westinghouse

TURNS IN 26-FOOT-WIDE CUT — Ability to turn in a box cut or on a narrow roadway is an important time-saver in many pits. This picture from Brazil well illustrates the unique turning ability of Tournarockers. Here the 16-ton "C" eliminates a 1000-ft back-in to the shovel by turning non-stop in a 26-ft wide cut. "Tournarockers' short turn radius (10½ ft with bowl raised) saves construction of access roads and turn-arounds," says Giovanni Sala, project mgr for owners Beretta & Novi. Cuts on this railroad relocation range from 50 to 100 ft deep, so turn-arounds would be very expensive. Besides the 2 Tournarockers, Beretta & Novi own 10 Tournapulls. They report, as typical output, 78,000 yds in 100 days for 2 Tournarockers in shovel-loaded sandstone and clay . . . 314,000 yds in 100 days for 6 Tournapulls push-loaded in sandy loam and clay. Hauls for all equipment averaged 4250 ft.

CLEAN OVER-EDGE DUMP — With front-wheel drive, Tournarocker backs safely to edge of bank. Loads fall free and fast. Little or no dump clean-up is required. Says Red Parrot Coal Co Supt F. Mason Morgan, user of unit shown, "Tournarocker works better than any rubber-tired equipment we've used."

COMPACTS COAL — Public Service Electric & Gas Co, Camden, NJ, hauls 208 tons of coal hourly from conveyor to stockpile with Tournatractor-Carryall team. On 760-ft cycles, "C" delivers 16 tons every 4½ min. Rig's big tires effectively compact, seal coal against spontaneous combustion.

. . with performance reports from around the world



FLYING GOLD-MINER — To reach isolated mine in center of Nicaragua, this 9-ton Tournarocker was cut apart and flown 110 mi over the jungle. Re-welded at job, it now hauls gold ore and waste to crusher. In typical month, it worked 356 hours, hauled 4698 tons. Hauls averaged 9800 ft, all up-grade, with 9500 ft at 3 to 10%, 300 ft at 12 to 20%.

DOUBLE-HEADER — This Tournatractor means business at both ends. Crane boom, designed by Standard Sand & Silica Co, Davenport, Fla, lifts with regular LeTourneau-Westinghouse motor, has 3-ton capacity. Front end mounts standard dozer blade.

50 TONS EVERY 4½ MINUTES — Stripping overburden from two soft coal veins near Clearfield, Pa, this big Model A Tournarocker carries 50 tons of slate, shale and clay per load. Time for complete 400-ft cycles averages only 4½ minutes.

FIRE-FIGHTER — In Missouri, Tournatractor helps combat stockpile fire by spreading burning coal. Continued use of this machine will greatly reduce possibility of more spontaneous combustion fires. Its big rubber tires compact coal and eliminate air spaces during normal travel across stockpile.

MORE THAN 1 WAY — When not needed for scraper work, J. W. Crowder, Houston, uses his C Tournapulls to haul from a dragline. Here, rig gets heaped load of tightly-compacted gumbo on dam and spillway construction job along the Sabine River in Texas. Unit made 2000-ft cycle in 3½ minutes.

(continued on next page)

Pictures of the month... *by LeTourneau-Westinghouse*

2½ MIN TO LOAD — It isn't often you see a big rig like a D Tournarocker loaded by a front-end loader. But Ft. Hartford Stone Quarry of Olaton, Kentucky teams the two to provide 100% of their limestone . . . and does it profitably! Their 9-ton Tournarocker takes 5 to 6 passes from the 1¼-yd bucket . . . is loaded with shot rock in 2 to 3 minutes. Complete 600-ft cycle to crusher takes 4 minutes. "Thoroughly sold on Tournarocker for this work," says A. C. Hall, Company President.

15¢ PER YD — For crusher, A. T. Waltenburg, Jackson County (Oregon) Hwy Supt, needs 500 tons of gravel per 8-hr day. He brought in a 9-ton D Tournarocker to replace 2 trucks. The one Tournarocker averages 64 yds hourly to deliver all gravel crusher can handle. "A real money-saver," says Waltenburg. "Moves dirt for under 15¢ a yd." Major saving is on repairs. Tournarockers' big tires absorb shocks. Unit has no frame, sub-frame, springs, spring hangers, hinged axles, hydraulics . . . hence is seldom in shop.

POWERFUL WINCH — Fast electric controls and 67,000 lb line pull make Tournatractor ideal for towing trucks out of mud or skidding equipment. Here, it tows enough Douglas fir for a bungalow (about 7000 bd ft). Owner is Roy Monschke, Fortuna, Calif.

STRIPPING FOR STEEL — To meet a vastly increased demand for limestone from the steel industry, Kelley Island Lime & Transport Co, Cleveland, works 2 C Tournapulls 16 hrs per day stripping limestone at their Marblehead quarries. The 2 units combined remove 418 to 436 bank yds of rocky loam overburden per 50-min hr. Hauling over rough, winding roads and up 1 to 10% grades, Tournapulls complete cycles of 2200 ft in 2¾ minutes.

. . with performance reports from around the world

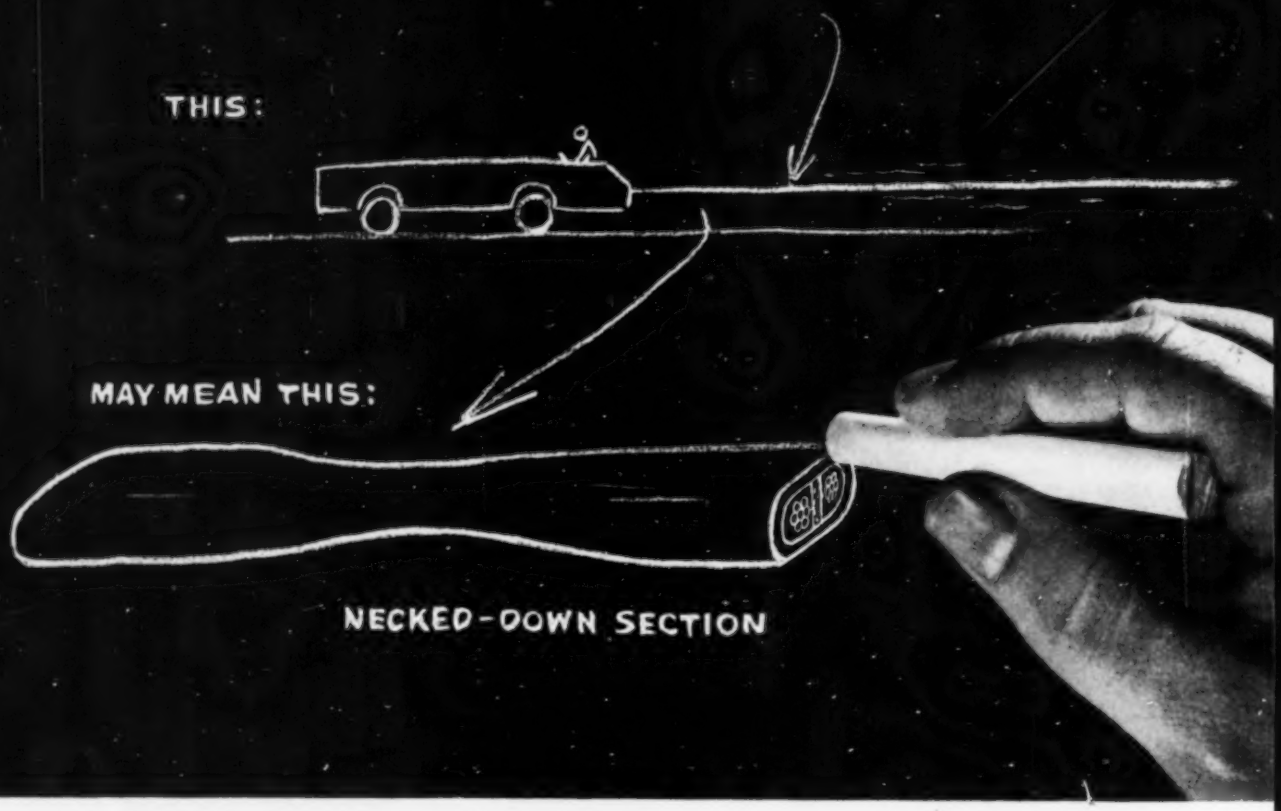
HEAVE-HO — Two ages meet on the Black Sea at Kozlu, Turkey. In the background, natives beach fishing boats just like their ancestors did hundreds of years ago. In the foreground, a modern high-speed Tournatractor lifts the loads from hundreds of aching backs as it levels spoil hauled by eight 22-yd trucks from the Eregli Coal Fields, Turkey's newest coal mine.

DOZES WET CLAY — Almost 1,000,000 yds were filled into Lake Michigan near Milwaukee recently to build a 900 x 900-ft coal dock. "Tournatractor handled output of 7 scrapers," reports Operator L. Dark. "One day, when rigs were on 600-ft haul, I dozed 6,390 yds into the lake. Also helped crawlers through the spread. Even had time to travel uphill to clean the cut."

NO TIRE BREAKAGE — After months of double-shift hauling of Florida pit rock, Maule Industries Inc report no tire troubles on their 18-ton Tournarocker. Its big 21.00 x 25 single tires rolled easily over blasted rock or quarry floor. Smaller 6 and 12 yd trucks, used on same hauls lost time due to blowouts and other tire damage. This was caused mostly by rocks wedging between the duals, or concentration of weight on a single small tire when rolling over rock fragments. Tournarocker and trucks brought shot limestone 1.8 to 2.2 miles from pit to crusher. For complete facts on this and other units shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Illinois.

Tournapull, Tournarocker—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark Pic. 483-M

HOW TO SPOT DAMAGE FROM TOO MUCH TENSION



. . . AND WHY ANACONDA'S NEW BALANCED DESIGN ADDS SAFETY, LONGER LIFE TO CABLE

Necked-down cable shows overstretching. Jacket and insulation become thin, easily punctured. Moisture penetration or a broken ground conductor may make the cable hazardous.

ANACONDA'S ANSWER: BALANCED DESIGN

Tension devices help; but aren't cure-alls. An added safeguard lies in the balanced design of Anaconda's new mining-machine cable. Stretchability of the ground has been increased. It will not break before the power conductors. A new neoprene jacket has higher compression-cutting resistance and tensile strength. In the insulation more strength and moisture resistance are obtained from a cold-rubber base . . . similar to that used by tire makers to mold a tougher tire. Stranding, too, has been redesigned to make the whole cable more flexible . . . at no greater cost. You get less trouble from tearing, cutting, gouging and abrasion caused by rib-pinching, runovers and dragging.

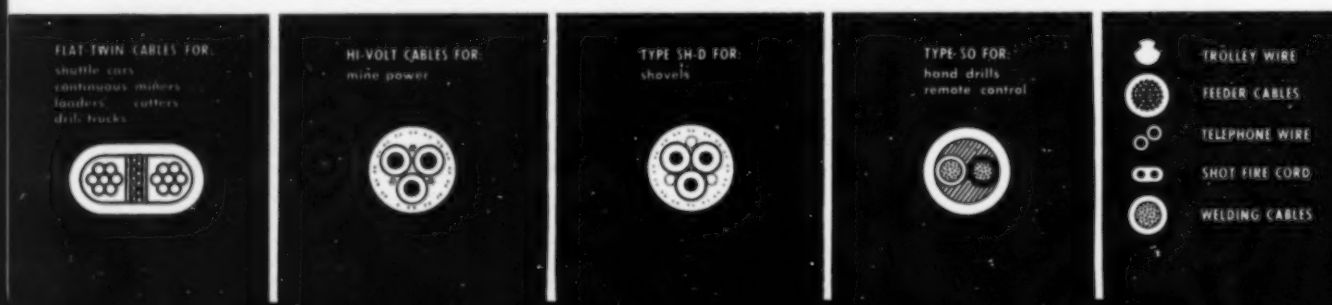
MUCH LONGER AVERAGE LIFE

In shuttle cars recently surveyed in 15 mines, ANACONDA Cables last 3 times as long as cables made only a few years ago. To learn why this is so, ask your nearest Anaconda Sales Office or Distributor for a sample section of this new cable. Examine it . . . take it apart. And remember that no ANACONDA Mine Cable has ever failed a U. S. Bureau of Mines flame test. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

53300

ANACONDA®

TODAY'S HEADQUARTERS FOR MINE CABLE



CARDOX Surface AUGER MINER drills!

NEW PROFITS out of "DEAD" STRIP MINES

CARDOX Surface AugerMiners burrow under excessive overburden . . . drill back 100 to 120 feet, to salvage deeply buried coal at a small fraction of the cost to the original working by conventional methods. *This is high-profit production in its most economical form!*

The rugged, powerful AugerMiner is trucked or towed on its detachable wheels to the face and positions itself to the height of the seam. Driven by a 145 H.P. engine, augers up to 36 inches in diameter drill out the coal ready for mechanical loading into trucks. The coal you get is clean and free of rock or shale because directional control keeps the auger boring into the best part of the seam. A built-in retriever easily adds or removes the six-foot auger sections.

If you have a property where overburden has choked off profitable stripping, the CARDOX Surface AugerMiner may open the way to the most profitable coal you've ever mined! See your CARDOX Representative—or write for AugerMiner bulletin

CARDOX Underground AugerMiner

For mines where thin seams or poor roof conditions make conventional mining unprofitable or unsafe, the CARDOX Underground AugerMiner can renew economical production. Write for bulletin.

CARDOX CORPORATION • **BELL BUILDING • CHICAGO 1, ILLINOIS**

WAREHOUSES

Harper, West Virginia
Phone: Beckley 4812

Benton, Illinois
Phone: Benton 625

St. Clairsville, Ohio
Phone: St. Clairsville, 619

Evansville, Indiana
307 Northwest Fifth St.
Phone: Evansville 2-8944

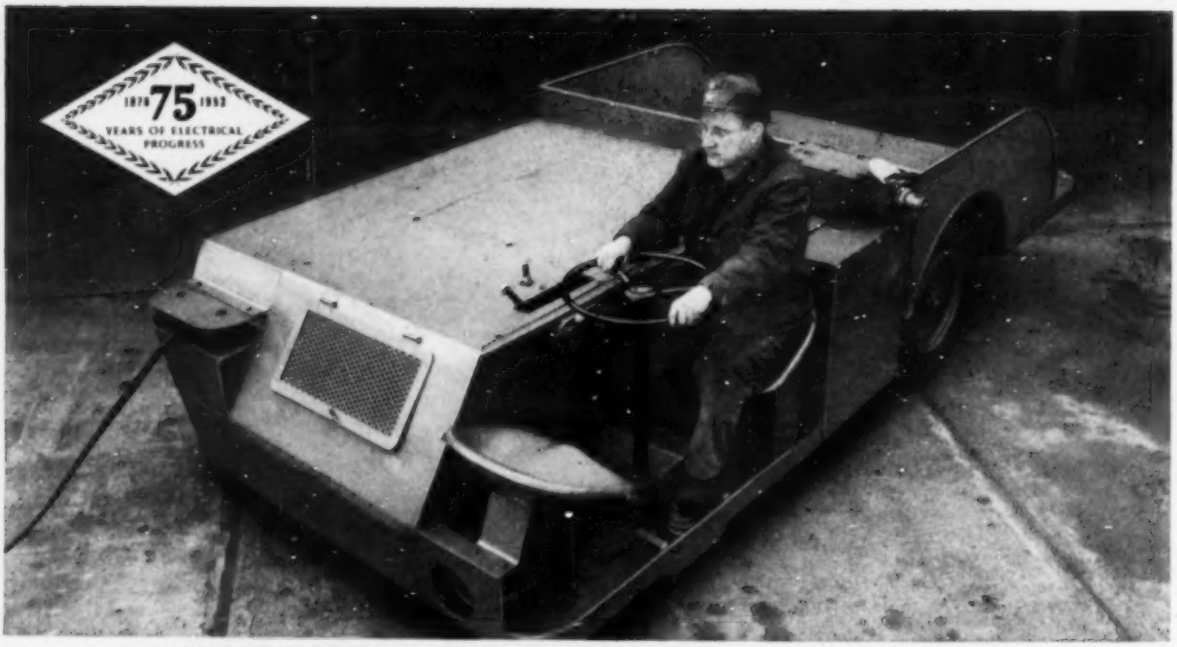
Pikeville, Kentucky
Route 2, Box 99
Phone: Robinson Creek 5

Library, Pennsylvania
Box 427
Phone: Library, Colonial 3-6910

Camden-on-Gauley, W. Va.
Phone: Camden-on-Gauley 2181

Louisville, Colorado
Phone: Louisville 234

Ottumwa, Iowa
Phone: Ottumwa 51



MANEUVERABLE NEW G-E POWERED TRUCK IS HANDY IN TRACKLESS MINING SYSTEMS

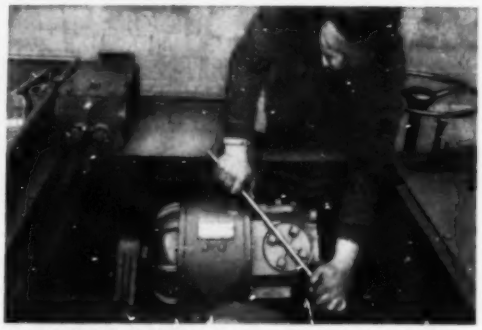
Easy-to-maintain motors power new mine truck

New G-E mine motors applied by Lee-Norse can be serviced quickly right on the trucks

Here's a typical use by mining machinery manufacturers of General Electric's new easier-to-maintain d-c mine motor. The Lee-Norse Co. of Charleroi, Pa., is using it in its versatile new service truck. This vehicle simplifies and speeds servicing of trackless mining sections.

Here's why Lee-Norse chose G-E mine motors: New two-stud construction makes all brushes easier to get at for inspection without dismantling motor or taking it off the truck—a big selling point with customers. Motor's compactness, with no part extending beyond its normal width, saves space within the truck—a big design point with Lee-Norse. And we'd be glad to show you 19 other reasons why this motor is easier to maintain, longer lasting, easier to install!

Whether *you* build motor-driven mining equipment, or order your own motors for your mining machines, check all the facts about this new, easiest-to-maintain G-E mine motor ever built. Ask your G-E Apparatus Sales Representative, or write for Bulletin GEA-5553 to General Electric Company, Section 663-36, Schenectady 5, N. Y.



NO SPECIAL TOOLS are needed to open one-piece hand-hole covers. They are easily screwed in or out of the motor—without disturbing the fan housing.

WIDE-OPEN ACCESSIBILITY to brushes—through only two instead of four openings—is provided by locating them all on the upper half of the commutator.

You can put your confidence in—

GENERAL ELECTRIC

The team that pulls production up

Goodman Cable Reel Shuttle Cars

. . . for rapid transfer of coal to haulage stations.

Goodman Swing-Motion Loaders

. . . for fast, complete loading in wide face rooms or in pillar extraction.

Type 570-571† 48″ ht.
Type 580-581† 42″ ht.
Type 582-583†† 42″ ht.
Type 370-371† 35″ ht.
Type 374-375†† 34″ ht.
Type 870 † 29″ ht.

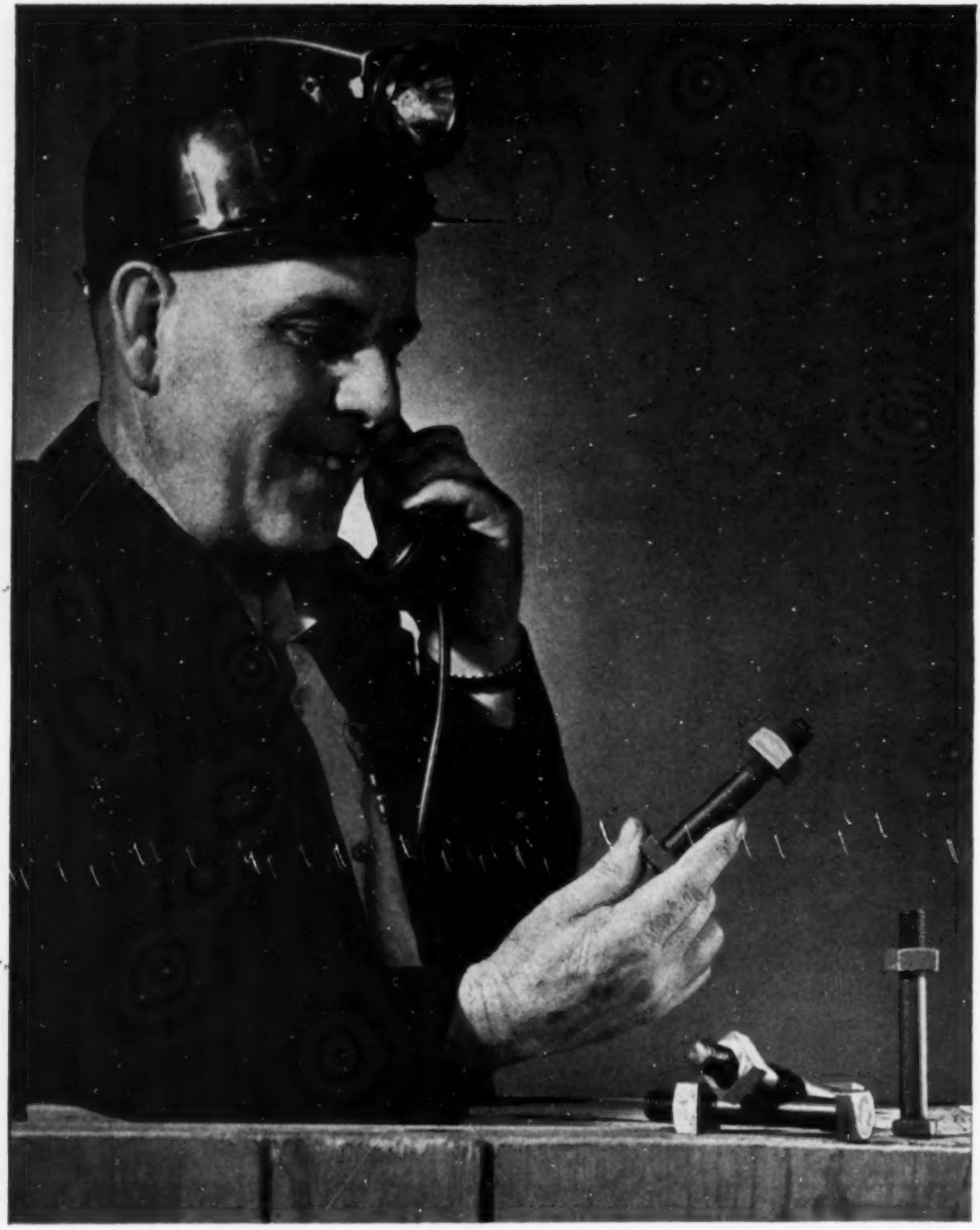
†Elevating discharge
††Fixed discharge

Type 665—tramming ht. 41½″
Type 666—tramming ht. 36½″
Type 660—tramming ht. 33″
Type 865—tramming ht. 26½″

It will pay you to investigate this working combination that delivers profitable performance between face and haulage system. See your Goodman salesman.

Goodman
MANUFACTURING COMPANY
4834 S. Halsted Street • Chicago 9, Illinois

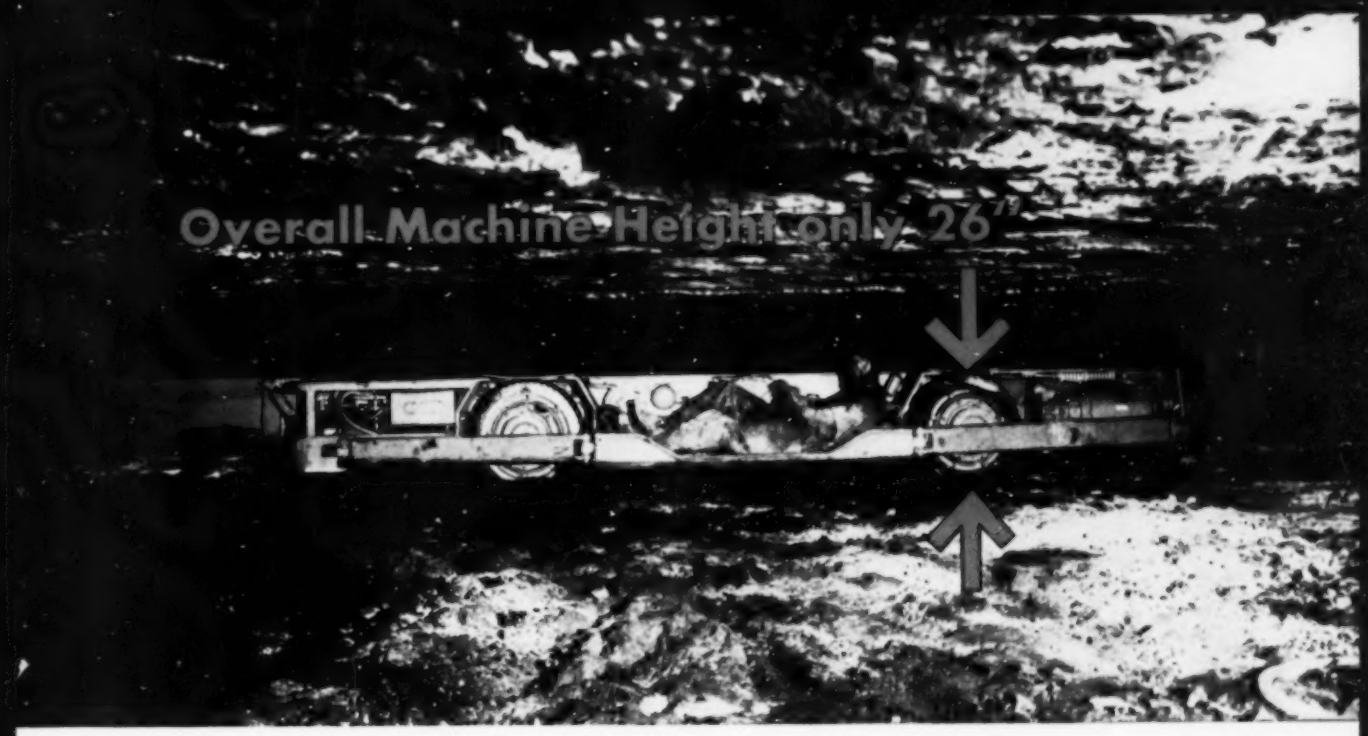
Cutting Machines · Conveyors · Loaders · Shuttle Cars · Locomotives · Continuous Miners



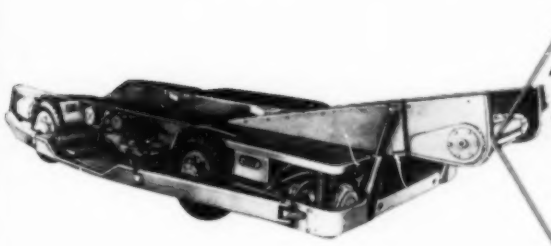
"I'm ordering machine bolts from Bethlehem again.

Their bolts are good, the kind you fellows like."

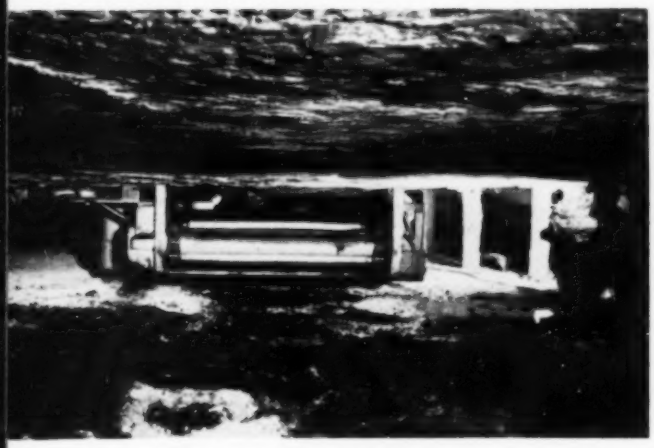
BETHLEHEM STEEL



When you're looking for dependable, high-tonnage hauling in very low coal...



The 8-SC SHUTTLE CAR *is YOUR VERY BEST BET!*



Only 26" high, the 8-SC Shuttle Car has a level capacity of 2 tons. With the 12-RB Cutter (26" high) and the 20-BU-1 Loader (24" high), it constitutes the first high-capacity mechanized mining team for very low coal. Other Joy equipment for any mining need.

The 8-SC is highly maneuverable and flexible—it loads, unloads and gets back again fast and dependably . . . *and that's what keeps costs down and tonnage up!*

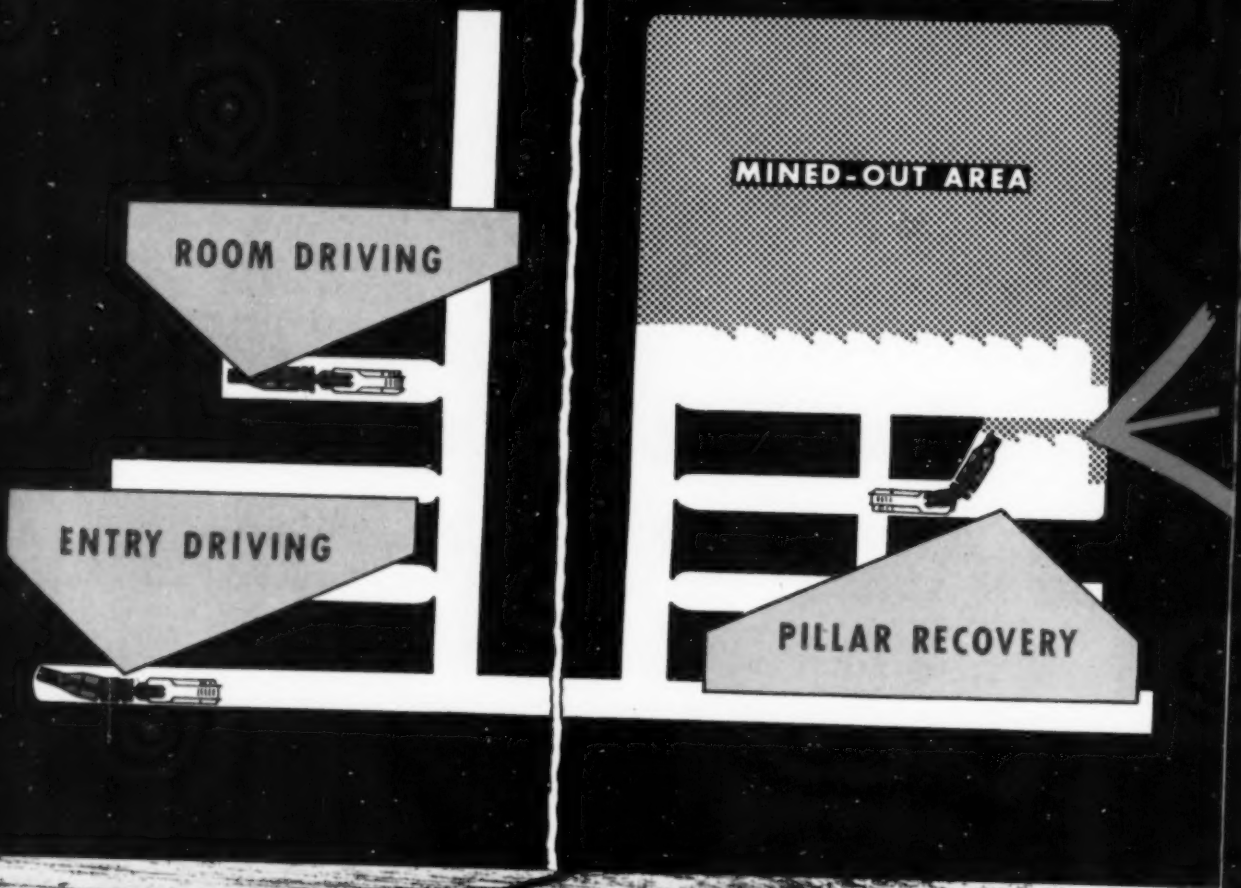
Features include: 4-wheel positive drive, 4-wheel brakes and 4-wheel steering, with a wider, tapered-end design that permits minimum turning clearance. Controls are centrally located; the operator has equal visibility in either direction. Separate motors for traction, conveyor drive and hydraulic pump drive. Hydraulic cable reel; hydraulically-adjustable elevating discharge. ● For full data, address ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.*

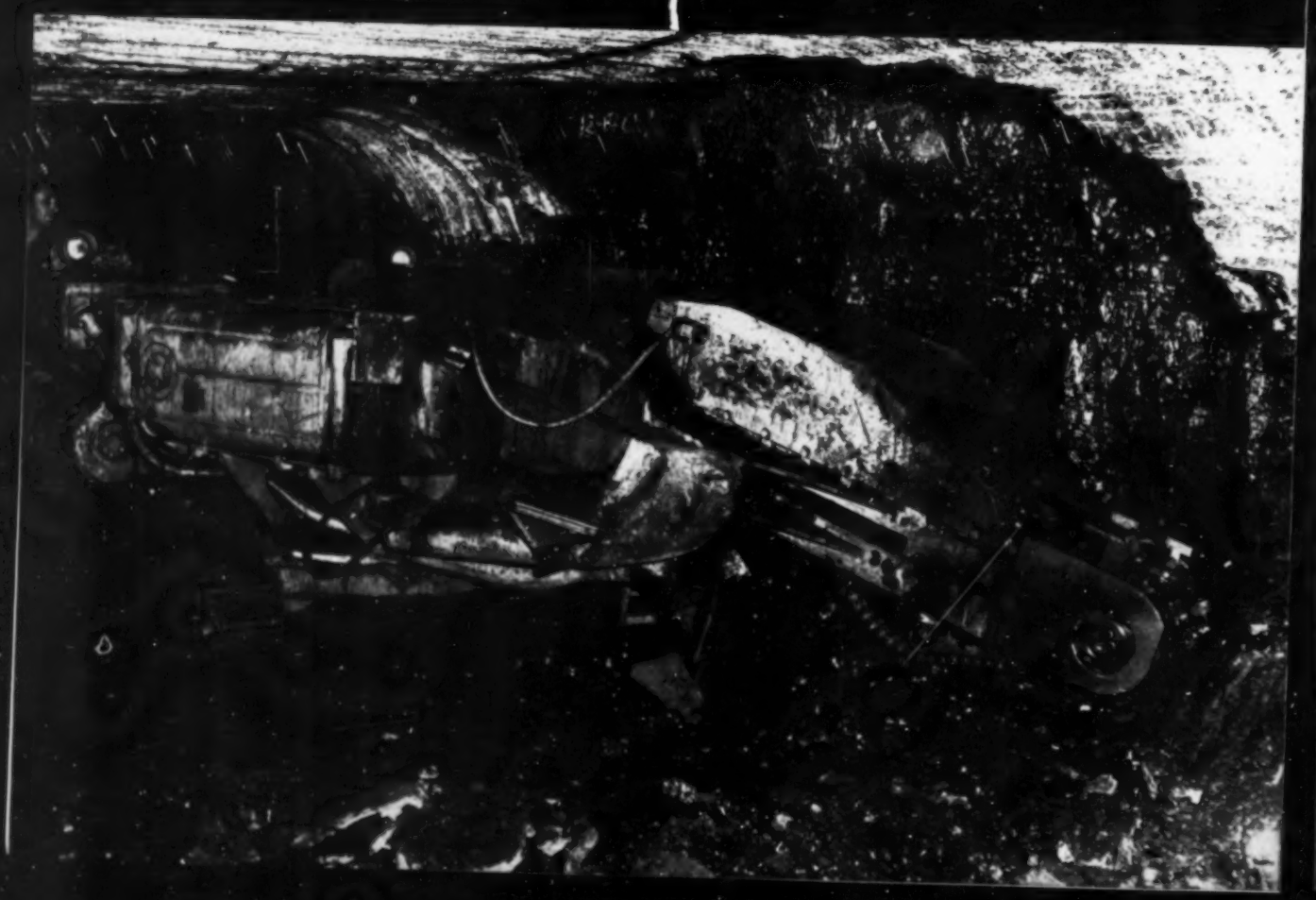
JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

WOD CL 4675

THE FLEXIBILITY THAT MEANS PEAK EFFICIENCY!





YOU GET GREATEST COAL RECOVERY

with the JOY CONTINUOUS MINER

A Joy Continuous Miner can operate in any mine it can enter. Thin seams, thick seams, split seams—all can be efficiently worked with this powerful, versatile machine that gets your coal without shooting . . . requires only the necessary additional equipment to transport the coal out of the mine.

Not only does the Continuous Miner do a quick, thorough job driving entries and rooms, it's also topnotch at pillar-recovery. These three main functions are illustrated in the drawing at the top of the page at left. Note how the Miner-and-shuttle-car team retreats after driving up a room, taking pillar as it comes back. The photo opposite shows a JCM on pillar recovery in a midwestern mine.

The Joy Continuous Miner is built in two models and four heights. The 3-JCM can be either 34″ or 39½″ high, and will mine from 6″ below to 66″ above bottom. The 4-JCM is available in 48″ or 53¼″ heights, and will mine from 5½″ below to 98½″ above bottom. With special equipment the 3-JCM can mine to 76″ above bottom, and the 4-JCM to 120″ above bottom.

A Joy Engineer will furnish full details on the Joy Continuous Miner. He will show you exactly how it can be used for high-production mining in your operation, at absolute rock-bottom cost per ton of coal mined.

Consult a Joy Engineer

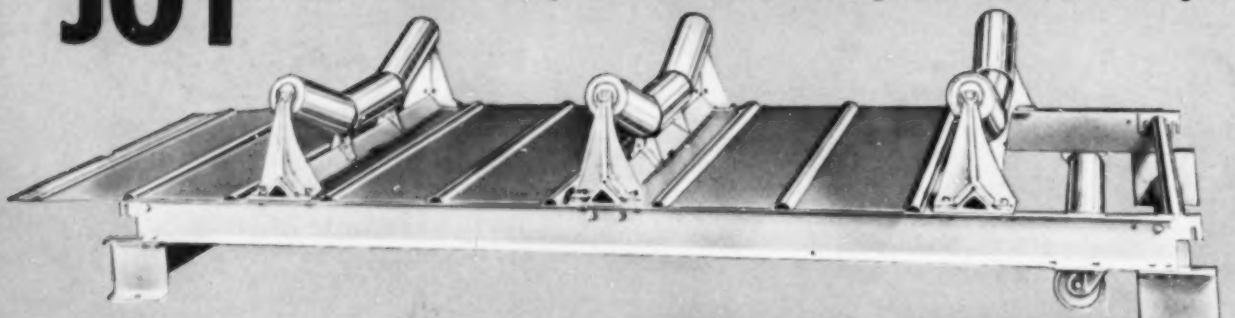
W&D CL 4160

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

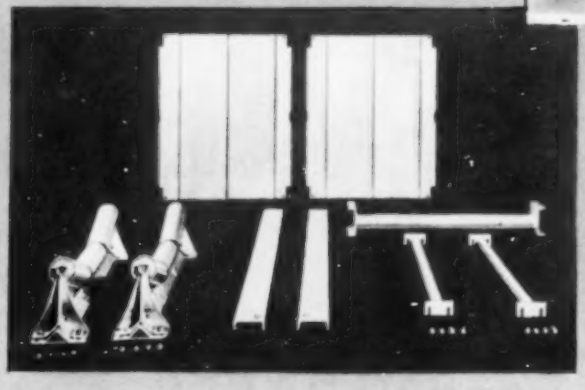
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

JOY... the most complete line of Underground Belt Conveyors



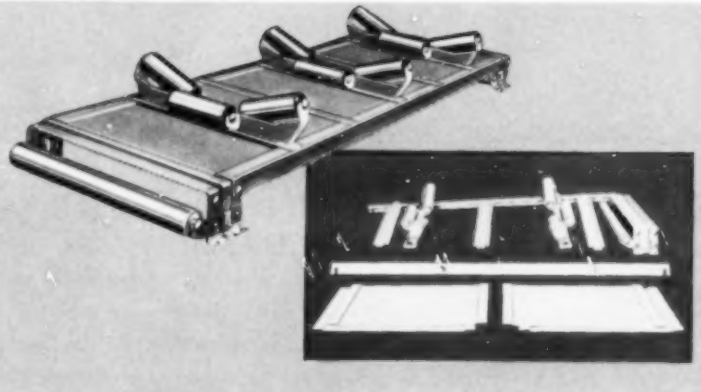
ABOVE: 12′ Intermediate Conveyor Section for very heavy duty. Unit is knockdown type, for use with 48″ belt. For additional strength, cover sheets are corrugated—stringers are of 6″ channel steel. Cross pipe spacers, which drop into place without bolts, rigidly brace the section and hold it in alignment. The cover sheets *lap under* the troughing idler base angles to prevent leakage. Belt idlers have grease-type bearings as standard equipment, but can be furnished with sealed, precision bearings.

RIGHT: 8′ Intermediate Conveyor Section, similar in design to above, for use with 42″ wide belt. This unit can be knocked down into easily handled pieces, as shown, for easy transportation.



RIGHT: 9′ Intermediate Conveyor Section of knockdown design. Can be furnished for 26-30-36-or-42″ belts. Belt idlers have sealed, precision bearings. Cradle is heavy, die-formed, ribbed pressed steel. This is a heavy duty unit of minimum height—15¾″ to 18¾″—for use in thin-seam mining.

RIGHT, BELOW: Similar style in 8′ length. Note that the only bolts used in joining are those which anchor the troughing idler brackets to the side rails.



ABOVE: Standard 8′ one-piece, channel-type Intermediate Section for limited tonnages. 3″, 4″, or 5″ channels. Sections are self-contained with cross pipe-spacers welded between channels. Pivotal section connection. Section connection made without bolts or loose parts of any kind.

LEFT: Three 9′ sections joined together. Each is of one-piece, welded construction. Side rails are 5″ steel channels. Ribbed pressed steel cradle. Pivotal section connections. For 30″, 36″ (illustrated), or 42″ belts.

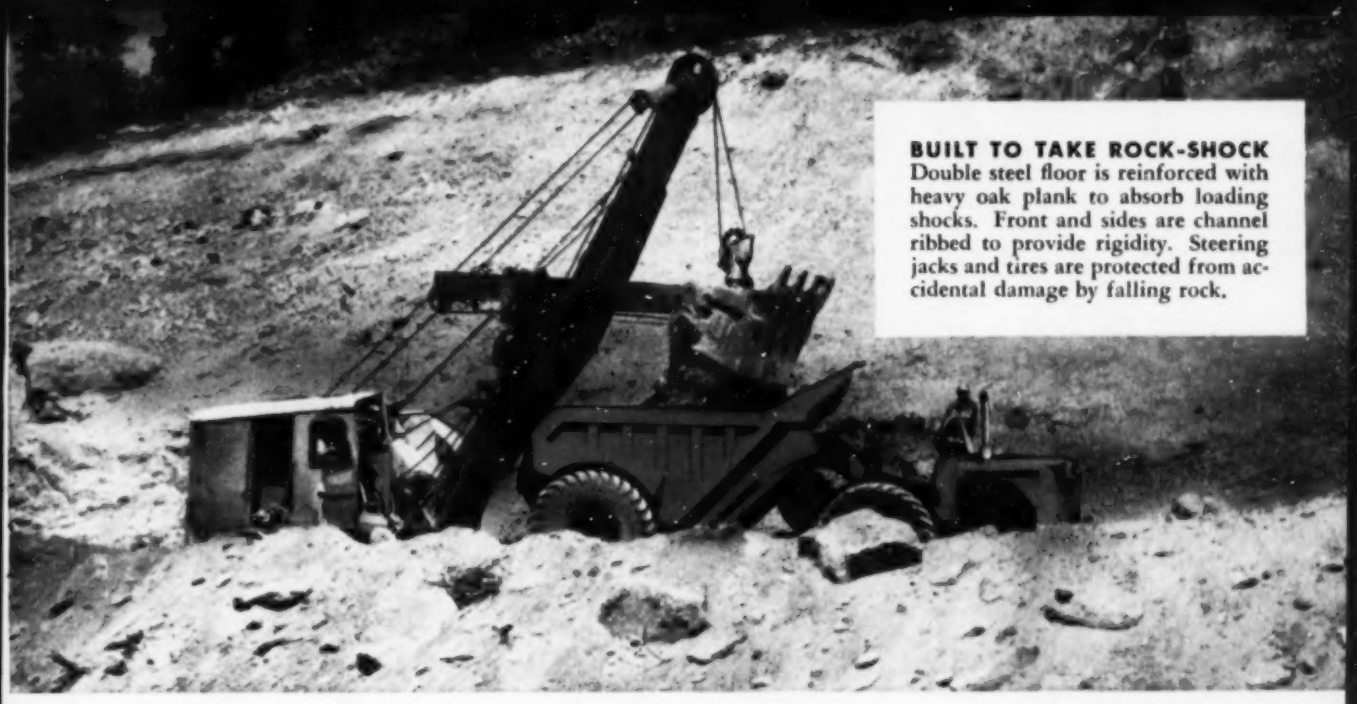
Consult a Joy Engineer

WAD CL 4340

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



BUILT TO TAKE ROCK-SHOCK
Double steel floor is reinforced with heavy oak plank to absorb loading shocks. Front and sides are channel ribbed to provide rigidity. Steering jacks and tires are protected from accidental damage by falling rock.

Allis-Chalmers MOTOR WAGON

built to meet today's high production demands

DUMPS SAFELY . . . CLEANLY — Wheel base remains constant during entire dumping cycle. With this stable wheel base, operator may back to the very edge of a steep fill, set the powerful air brakes on *all four* wheels and put the entire load over the edge.

Clean interior, plus high, 70-degree tilt assures complete load ejection. Body may be heated by exhaust to prevent freezing of materials in severe temperatures.

MULTIPLY TRACTOR USE WITH INTERCHANGEABLE SCRAPER BODY . . . for stripping and other self-loading operations. TS-200 Motor Scraper is a high-speed, rubber-tired unit with 13-yard capacity, "through-the-center" boiling action for easy loading, positive forced ejection and many other high-production features.

Ask your Allis-Chalmers dealer for the full story.

TRAVELS FAST — High horsepower-to-yardage ratio and large, high-traction rock-lug tires give fast average travel speeds — even on adverse grades and heavy going. Delivers more loads per hour; reduces idle shovel time.

ALLIS-CHALMERS MODEL TR-200 REAR-DUMP MOTOR WAGON

Choice of Engines—165 hp. Cummins; 176 hp. Buda.
Capacity — 15 cu. yd., heaped; 18 tons.
Speeds — Five forward to 21.6 mph.; reverse to 2.5 mph.
Hydraulic steering and dumping.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Here's

S11 on standard feed leg. Weight, 90 lbs.

S11ST Offset telescopic-leg stoper. 28" — 40" — 52" feeds. Some mines drill 36- to 40-foot holes, using coupled steels.

S11S Offset stoper.

Le Roi-CLEVELAND "Offset" Stopers

make roof bolting faster, easier

- **Complete range of sizes** for every mining condition including low coal.
- **Durability** keeps Le Roi-CLEVELAND Stopers underground.
- **Easy to handle** — fast drillers.
- **Trip rotation** lets you use the same stoper for driving roof bolts that you use for drilling.

why...

...stoping operations go faster and cost less, when you use Le Roi-CLEVELAND Stopers

FOR all raise or any uphole-work, drilling goes better with a Le Roi-CLEVELAND Stoper on the job.

Now, why is that? On the surface, a Le Roi-CLEVELAND looks pretty much like other makes of stopers. But—see a Le Roi-CLEVELAND in action. Actually use it. Then you can tell the difference.

It all boils down to one thing — Le Roi-CLEVELAND *design*. Right there, you have the basic reason why Le Roi-CLEVELAND Stopers produce extra footage per shift . . . why tonnages are greater . . . why mining and maintenance costs are lower.

Le Roi-CLEVELAND Stopers are available in 90- and 120-lb. sizes, to meet every mining condition. Ask your Le Roi representative for detailed information on the units that meet your particular needs. See him soon.

Write for free Bulletin No. RD25.

CLEVELAND ROCK DRILL DIVISION
Le Roi Company

12500 BEREA ROAD • CLEVELAND 11, OHIO
Plants: Milwaukee, Cleveland and Greenwich, Ohio

Trouble-free performance is built right in

1. End-seating valve has short travel. Its snappy action provides powerful blow, strong rotation, and fast drilling speed. Air consumption is low and valve efficiency is not affected by wear.
2. Air-feed relief control trigger is close to operator's thumb as he holds the handle grip. Slight pressure on the trigger eases up on the air feed — more pressure drops the drill back slightly, or returns it to its fully closed position.
3. Inside of air-feed cylinder is polished, to provide free action and insure longer life for cup leathers.
4. Trip rotation lets the operator stop and start rotation at will — a big help in collaring the hole. It's a safety factor, too: When a steel sticks suddenly, the pull of the rotation on the operator's hand turns the hand-grip sleeve, stopping the rotation before the machine can cause injury.
5. Air-feed piston is an integral forged tube—not welded or brazed.
6. Constant blowing around the steel keeps cuttings out of the chuck.
7. Rotating sleeve and spacer are built to withstand wear and fatigue.
8. Efficient lubrication protects all surfaces, adds to the dependability of Le Roi-CLEVELAND machines.

RD-36

Sanford-Day... the mining industry's Super

POTASH CAR BUILT BY SANFORD-DAY . . . This car shown at right is one of the S-D Automatic Bottom Dumping Cars built for U. S. Potash Co. for their Carlsbad Mine. We built these cars of one-half inch steel for heavy duty performance. The car represents another Sanford-Day development toward extending the life of cars in tough service, to increase haulage efficiency and reduce maintenance costs.

SALT CARS BUILT BY SANFORD-DAY . . . Shown at left are the S-D Automatic Bottom Dumping Mine Cars built by Sanford-Day for Leslie Salt Company many years ago. These cars, constructed of wood to handle salt, are still in operation. They are an example of the emphasis Sanford-Day places on the important details of construction to enable you to obtain more years of service from your cars.

SANFORD-DAY IRON WORKS,

Market for mine cars!

When you need mine cars you want cars built to meet your own requirements. Sanford-Day is your Super Market for mine cars.

We have listed above many of the various purposes for which we have built mine cars. The photos on these pages show a few of the many types of cars we have built for coal, metal and non-metallic mines.

Regardless whether you need one car or 101, don't hesitate to get one of our engineers into your mine with your officials—face to face with your problem. With this type of cooperation, plus our facilities and capacity to build any type mine car of any size, any haulage problem in your mine can be solved.

ROTARY DUMP CAR BUILT BY SANFORD-DAY . . . We show above one of the hundreds of Rotary Dump Cars we have built for many coal mines. We developed the "low-floor" types of large capacity cars and S-D "Whopper" Rotary Dump cars to give you more capacity for any given overall dimensions.

GYPSUM CAR BUILT BY SANFORD-DAY . . . Here is another S-D Automatic Bottom Dumping Car development for metal and non-metallic mines. This car is one of many specially built for Certain-Teed Products Corp. for hauling gypsum . . . hauling non-stop because S-D Automatics dump on the move. Extra heavy steel plates were used in the construction to absorb shock loads.

After 50 years of leadership in the industry, Sanford-Day still devotes its entire capacity to the production of mine cars. Most improvements in mine cars originate with this company.

KNOXVILLE, TENN.

Now-Standardize on TAPER-LOCK

Now, for the first time, you can have all the benefits of standardizing on a truly modern method of mounting wheels on shafts . . . through the famous Dodge patented Taper-Lock design.

The time-saving, cost-cutting performance of Dodge Taper-Lock . . . already proved in millions of installations of Taper-Lock Sheaves, Couplings and Conveyor Pulleys . . . is now available in a complete line of Taper-Lock Sprockets with Dodge Roller Chain.

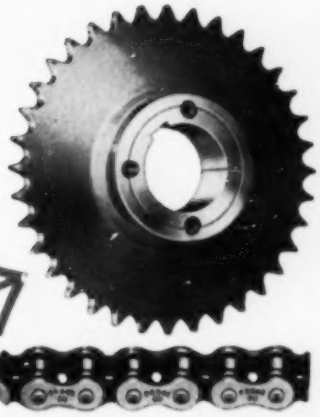
The bushing pictured here fits into the hub of every one of the Dodge products shown—sprockets, sheaves, couplings, conveyor pulleys. Both tapered bushings and hubs are precision machined to achieve perfect interchangeability. The result is less down-time on machines, simpler maintenance, reduced inventories. Taper-Lock gives you an unmatched opportunity to lower your costs and keep production rolling.

Dodge Taper-Lock grips the shaft for the full length of the bushing—holds with the firmness of a shrunk-on fit, yet comes off easily, quickly.

Taper-Lock's exclusive advantages were never more strikingly proved than in the new line of sprockets recently introduced by Dodge. For Taper-Lock brings to sprockets a new "off-the-shelf" availability. No time-consuming and costly reboring, key seating, drilling and tapping for set screws, needed to fit them to the shaft! Dodge Taper-Lock is available in both driver and driven sprockets from No. 40 to No. 100, up to 112 teeth. Taper-Lock bushings to fit shafts from ½" to 10" are available from stock.

Consider carefully the cost-saving advantages you get by standardizing on Taper-Lock — the modern method of mounting wheels on shafts. For further information, call your Dodge Distributor, or write the factory.

DODGE MANUFACTURING CORPORATION, 3000 Union Street, Mishawaka, Indiana



TAPER-LOCK SPROCKETS and Dodge Quality Roller Chain

—THE MODERN WAY TO MOUNT SPROCKETS

—THE MODERN WAY TO MOUNT SHEAVES

TAPER-LOCK SHEAVES

—THE MODERN WAY TO MOUNT COUPLINGS

TAPER-LOCK COUPLINGS Rigid and Flexible

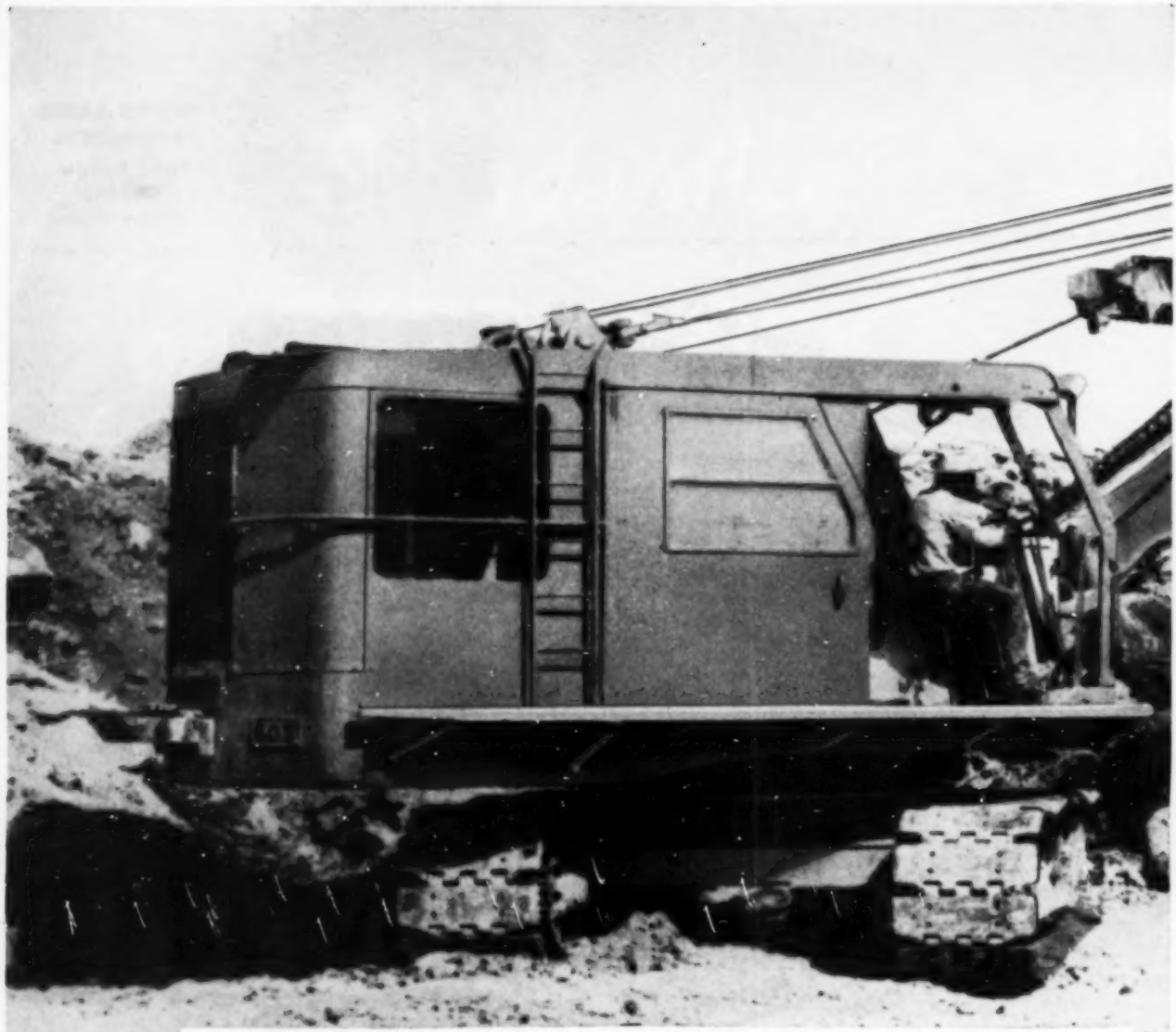
—THE MODERN WAY TO MOUNT CONVEYOR PULLEYS

TAPER-LOCK SOLID-STEEL CONVEYOR PULLEYS

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified phone book.

DODGE

of Mishawaka, Ind.



MEASURE OUTPUT by "KOEHRING WORK CAPACITY"

With Koehring excavators and cranes you gain an important production advantage in extra work capacity. There are some very simple ways to check this. Take lifting capacities, for instance. The machine with the heaviest lift capacity not only picks up larger crane loads — it also has more stability and power to increase shovel, dragline and clamshell output. Be sure to check lift ratings, and other clear-cut measurements of "KOEHRING WORK CAPACITY" before you buy any excavator or crane. Your Koehring distributor has important figures to show you. See him soon.

K331

lift capacities up to 79½ TONS . . . ½ to 2½ YARDS dipper capacities

BIG-PRODUCTION TEAM — Loading out big-chunk rock, this Koehring 1½-yard shovel is teamed up with Koehring 6-yard Dumpters.® Fast-spotting Dumpters move in close, keep shovel swing short. Square 8 x 8-ft. body permits loading over side or end. No-turn shuttle hauling and instant gravity-dump speed haul cycles.

KOEHRING Company MILWAUKEE 16, WISCONSIN

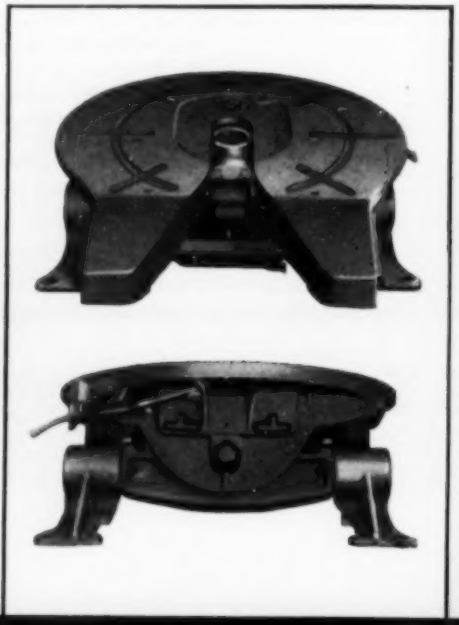
Subsidiaries: Parsons • Kwik-Mix • Johnson

Marion shovel, loading a 34-ton coal payload into one of 23 Austin-Western trailers powered by Dart tractors. Scene is at Midland Electric Coal Corporation's strip mine near Farmington, Ill.

ASF Safety 5th Wheels have to be tough to stand up in this heavy-duty service, especially during wet weather when tractors are needed at each end of the semi to get it out of soft ground. Because ASF 5th Wheels are so easy to uncouple, in effect Midland has a *flexible pool* of load-carrying equipment and motive power, rather than 23 separate units. The result is fuller, more efficient use of available equipment.

Back and turn on a dime—In addition to quick interchange between motive power and load-carrying equipment, the tractor-trailer is highly maneuverable. ASF 5th Wheels are side-oscillating: even a full load can be safely and easily jacknifed for a short turning radius.

Heart of the semi—the ASF 5th Wheel—36" extra-heavy-duty ASF Safety 5th Wheel made for the rugged service and heavy loads found in off-highway work. Note the heavily reinforced plate; the massive "I" section center beam; the extra-strong mounting brackets.



He speaks through firsthand experience—M. R. Heckard, Superintendent of Equipment, has used ASF Safety 5th Wheels on all semi's for 11 years. He particularly likes the comparatively new 36" wheel shown at left; feels it will cut maintenance costs to a new low.

The Midland Electric Coal Corporation proves that your best investment for efficient tractor-trailer operation is an ASF Safety 5th Wheel . . .

"Best of all—they're easy to uncouple"

Ease of uncoupling is one of the big reasons why ASF Safety 5th Wheels are standard equipment on the fleet of semi's at Midland Electric Coal Corporation's strip mine near Farmington, Ill. M. R. "Marty" Heckard, Superintendent of Equipment, says:

"We use ASF 5th Wheels on all our semi's, and each wheel takes a real beating during the loading and hauling of a 34-ton payload around 30 times a day.

"One of the main reasons why we like these 5th Wheels is because they are easy to keep free of slack. We just add a shim usually once a year.

"Best of all, however, they are easy to uncouple in a matter of minutes. We can easily shop the tractor for maintenance without the trailer, or vice versa. Working on one at a time makes servicing easier, and we avoid tying up the whole semi."

Quick interchange between motive power and load-carrying equipment is a real asset in mining and quarry work. And there's no denying that you get it with a tractor-trailer. But a 5th wheel—or any hitching device—tends to defeat its purpose if it's hard to uncouple.

Easy uncoupling can save you time, trouble and expense, as it has in this modern strip mine operation. But, it's equally important to know that the ASF Wheel *only uncouples when you want it to uncouple*. This is no beefed-up highway wheel. It's made specially for heavy-duty off-highway service, from the "I" section center beam to the side-oscillating plate that absorbs the sidestrain of uneven roadway. Until a twist of the wrist releases the king-pin, it's built to *stay* coupled—come shocks, strains or high water!

Get the facts on the best 5th wheel investment you can make! See your nearest ASF Distributor, or write: American Steel Foundries, Automotive Division, 410 N. Michigan Avenue, Chicago 11, Ill.

remember this . . . about ASF safety 5th wheels

Largest king-pin bearing area of any 5th wheel . . . Stresses absorbed by a larger bearing area—larger than any other 5th wheel—means longer life for king-pin and jaws.

Shorter king-pin bending leverage . . . Jaws grip the king-pin at the top. The pin *stays straight*—and can't "spring" or disengage.

Side oscillation protects equipment . . . 1½° of free oscillation—plus 5½° controlled by rubber stabilizers—absorbs sidestrain of uneven roadway.

Heavy, cast alloy-steel construction . . . Plate is hinged on strong, rigid "I" beam with big 2" pin. Extra large contact area between plate and beam doubles rocker life. Both rocker and cast-steel bracket are bronze-bushed to cut wear to a minimum.

Easy to maintain in perfect operating condition . . . Wear is inevitable, but on ASF Wheels, it's easily counteracted simply by inserting one or more low-cost shims between buffer and housing front wall. Result? Like-new service, without expensive rebuilding!

A quick glance tells you the lock is LOCKED . . .

LOCKED—as quickly shown by the lever and safety latch—which can *only be in these positions* when the jaws are truly locked.

UNLOCKING—with an easy twist of the wrist. Simply move the safety latch up, and pull the lever forward.

UNLOCKED—ready for uncoupling; parts in lockset position. *Handle can only move back to locked position when the jaws are locked in the next coupling operation!*

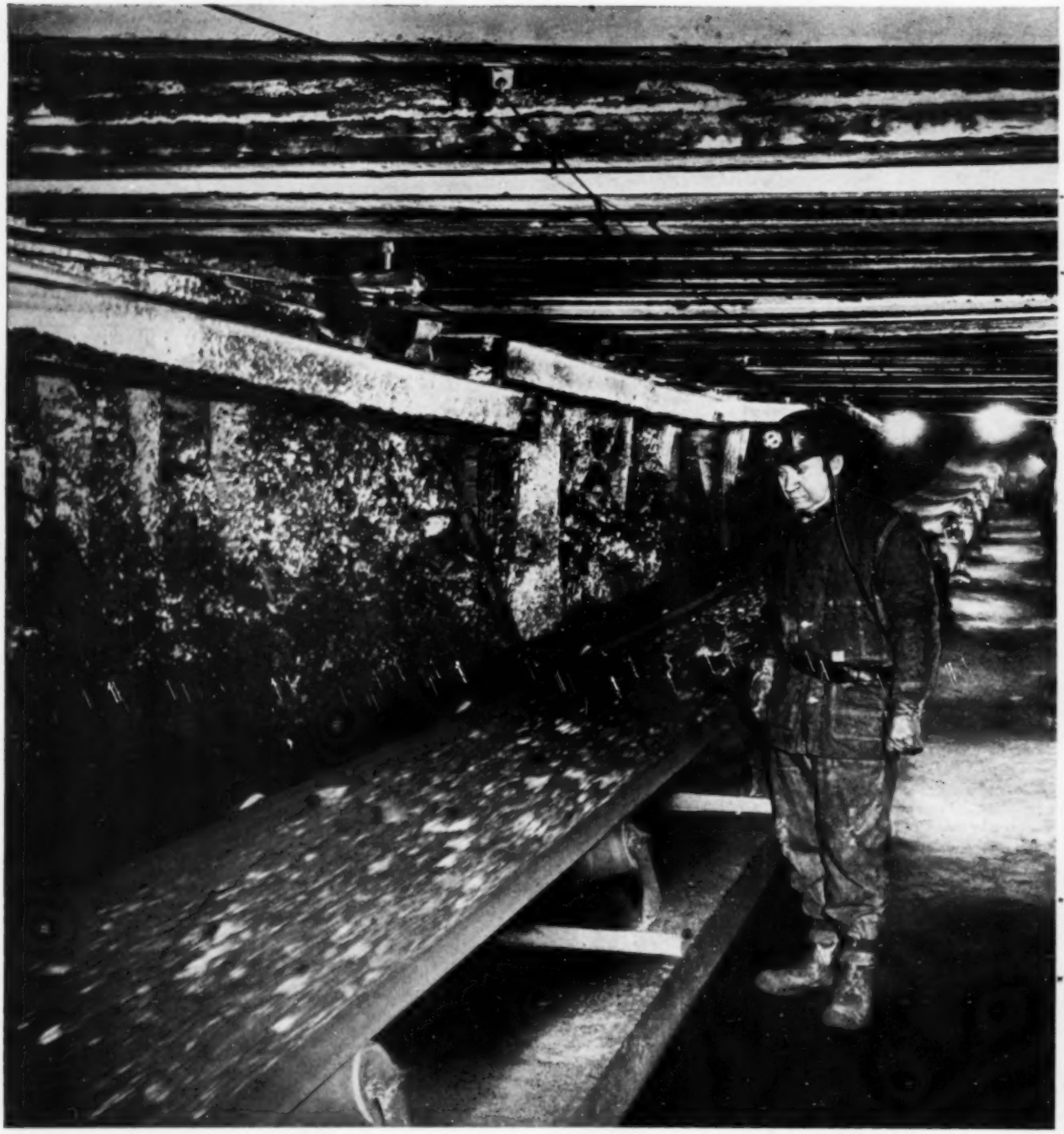
A 3,000-pound "compression-grip" saves your maintenance dollars . . .

COUPLING—as the king-pin enters the jaws, the jaws are forced back against the exclusive ASF rubber buffer block, building up compression.

COMPRESSING—3000 pounds are built up before the lock clears the rear jaw, allowing lock to snap to locked position.

LOCKED—and the jaws *remain* under compression. The grip is like a vise; eliminates the slack and backlash that can cost you money in added 5th wheel and king-pin wear.

3½-Mile Conveyor System



HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Connects Face to Tipple

EQUIPMENT: 3½-mile long Hewitt-Robins Belt Conveyor System consisting of nine sections: six 30" standard heavy-duty underground mine conveyors, one 36" slope conveyor and two 36" surface conveyors.

LOCATION: Ebensburg Coal Company, Mine No. 1, Colver, Penna.

MATERIAL HANDLED: 12" maximum size, r.o.m. lump coal.

PERFORMANCE: This Hewitt-Robins Conveyor belt system handles coal at an average rate of 250 T.P.H. with peak loads running as high as 300 T.P.H. The six 30" underground conveyors operate at 400 F.P.M. and the 36" slope and surface conveyors, at approximately 350 F.P.M.

RESULTS: The performance of this installation has been quite satisfactory from the standpoint of both Operating and Maintenance Costs.

Engineering Data

MINE-TYPE SHUTTLE CONVEYOR: The answer to truly continuous mining . . . it follows the working face and at the same time maintains a fixed transfer point through a fixed tripper—unit is extendable and retractable up to 600'.

SECTIONALIZED MINE CONVEYORS: For main and panel entry haulage . . . available in 8', 10' and 12' sections with choice of 24", 26", 30", 36", 42" and 48" belt widths. Conveyor sections are selected to provide proper idler spacing to suit conditions.

ENGINEERED CONVEYORS: Designed to meet particular local conditions . . . available in belt widths from 16" to 72" . . . supplied with anti-friction idlers having 4" to 7" diam. pulleys. When required, 2½" offset, mine-type troughing idlers can be supplied where height limitations demand their use.

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:
- ☐ —Belt
- ☐ —Dock
- ☐ —Mine
- ☐ —Shuttle
- ☐ —Slope
- ☐ —Vibrating
- ☑ —Fixed Tripper Shuttle

BELTING:
- *☐ —Elevator
- *☐ —General
- *☐ —Hot Materials
- *☐ —Raynile®
- *☐ —Steel Wrapper
- *☐ —Transmission
- ☐ —Woven Wire

- ☐ BUCKET ELEVATORS
- ☐ IDLERS

SCREEN CLOTH:
- ☐ —Electrically Heated
- ☐ —General

VIBRATING SCREENS:
- ☐ —Dewaterizers
- ☐ —General
- ☐ —Heavy-Duty Scalpers
- ☐ —Heavy Media

HOSE:
- *☐ —Acid
- *☐ —Air
- *☐ —Air Drill
- *☐ —Fire
- *☐ —Pinch Valve
- *☐ —Servall®
- *☐ —Steam
- *☐ —Twin-Weld®
- *☐ —Water
- *☐ —Water Suction
- *☐ —Flexible Rubber Pipe

- ☐ MECHANICAL FEEDERS
- ☐ STACKERS
- ☐ CAR SHAKEOUTS
- ☐ TRIPPERS
- ☐ BELT CLEANERS
- *☐ GROOVED PULLEY LAGGING
- ☐ CRUSHERS
- ☐ PICKING TABLES
- ☐ LOADING BOOMS
- ☐ RUBBERLOKT® BRUSHES
- ☐ MOLDED RUBBER PRODUCTS
- ☐ DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor (See "Rubber Products," Classified Phone Book.)

Hewitt-Robins Incorporated
666 Glenbrook Road
Stamford, Connecticut

NAME

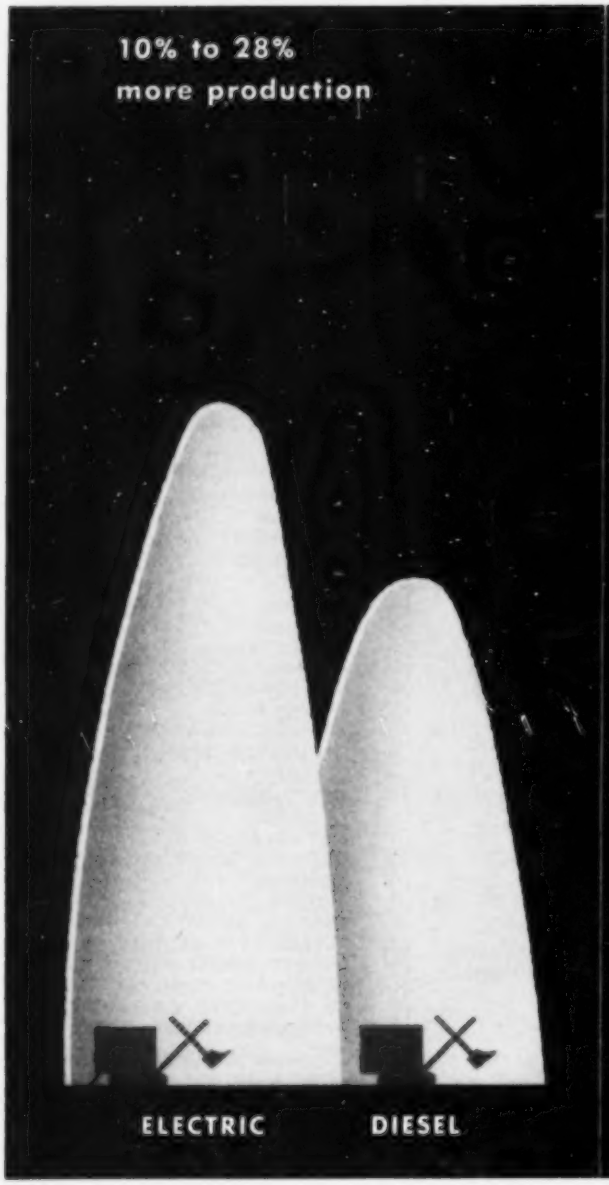
TITLE & COMPANY

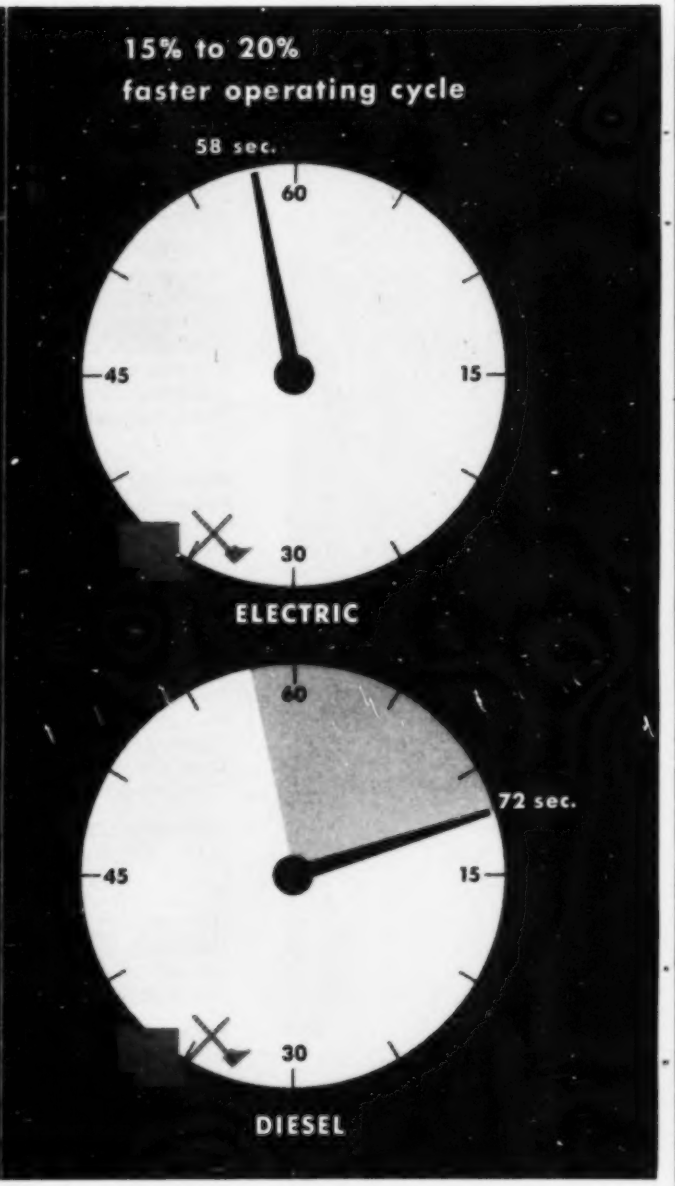
STREET ADDRESS

CITY PO ZONE STATE 1428

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City

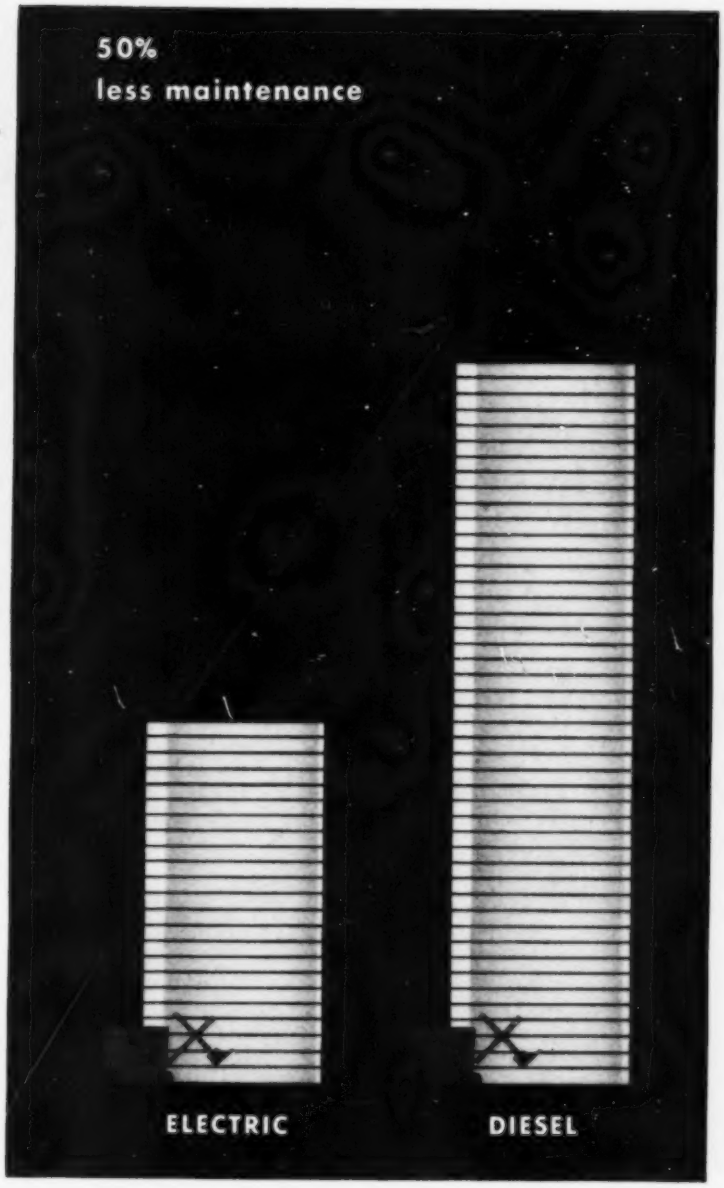




10% to 28% more production—One shovel manufacturer studied both electric and diesel powered, 13 cubic yard units working under equal conditions. Results showed that the all-electric shovel was about 28% more productive. It's been proved that all-electric shovels and draglines will outproduce any other type by at least 10% in any size range from 2½ cubic yards up.

15% to 20% faster operating cycle—One reason for such fast performance is that all-electric units, unencumbered by mechanical brakes and slipping clutches, have an infinitely faster transmission of power. Precise speed and power control make it possible to design electric machines for much higher operating speeds than all other types of shovels and draglines.

Have you considered all the advantages of electric shovel operations?



50% less maintenance—One large shovel manufacturer has estimated that your maintenance of power equipment alone would be approximately 50% less if you switch to an electric shovel or dragline operation. Your savings in maintenance would amount to about $150 to $175 per month, based upon a 40-hour week, single-shift operation with a medium-sized machine.

Two leading shovel manufacturers, who build both electric and diesel powered units, say you can't beat electric drives for shovel performance. They agree that all-electric (Ward-Leonard type) shovels and draglines, such as Westinghouse-equipped machines, are the most productive types for any operation. These figures show why!

All-electric shovels and draglines give you:

10% to 28% more production
15% to 20% faster operating cycle
50% less maintenance

What about initial costs? All-electric shovels and draglines have a higher initial cost in smaller sizes, but actually cost less in the larger machines. However, even in the smaller sizes, the productive life of an all-electric shovel or dragline is roughly *double* that of comparable engine-driven unit.

Save money . . . Call Westinghouse before you buy!

If you're considering a new shovel or dragline, call your Westinghouse representative before you buy. He'll show you how Westinghouse-equipped shovels and draglines can give you these and other dollar-saving benefits. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94995

YOU CAN BE SURE...IF IT'S Westinghouse

V & C Coal Corporation finds that **4,000-foot belt reinforced with "Cordura" gives trouble-free service in 8-hour-per-day operation**

View of loading point inside mine. The main belt, reinforced with Du Pont "Cordura", is loaded by feeder belts from the different cross entries where the coal is dug. It operates under low-ceiling conditions . . . with considerable dust or dampness.

The entire production of the V&C Coal Corporation's mine, at Grays Knob, Ky., depends on the performance of the main conveyor belt, shown above, which operates continuously for 8 hours per day. Produced by the Manhattan Rubber Division of Raybestos-Manhattan and sinewed for strength with Du Pont Cordura* High Tenacity Rayon, this belt has been steadily extended to reach new working areas . . . now is 4,000 feet between centers. The mine operators report that they have never had any trouble with it . . . though the belt it replaced had broken down at times while operating on 2,800-foot centers.

The high strength of Du Pont "Cordura" makes possible belting that's stronger, yet thinner, for better troughing and training. And the low stretch of "Cordura" saves costly shutdowns for take-up and resplicing.

Before you order your next conveyor belt, inquire about the use of "Cordura" rayon in belts. We'll send you the names of suppliers . . . together with full information. Just write for your free copy of "Sinews for Industry." Address: Textile Fibers Dept., Room 2520-C, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U.S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

will yours look this good after..

14 YEARS

This TSP Drum Gear and Pinion was installed in 1939 on a 40 H.P. Man and Supply Hoist at the Carbon Fuel Co., Carbon, West Virginia. Gears and pinions they replaced lasted only two years. TSP Drum Gear and Pinion are still in operation less than 50% worn.

Here's why: "Tool Steel Process" Gears and Pinions are made of low carbon alloy steel. File-hard wearing surfaces are backed by a tough ductile core, resulting in super resistance to wear and fatigue.

You receive an absolutely positive written GUARANTEE that TSP Products will give a longer life in the same service than any other product.

Specify "Tool Steel Process" Products today! Write for Bulletin 252.

THE TOOL STEEL GEAR AND PINION CO.

Ad No. 10

The Standard of Quality Since 1909 for
Gears • Pinions • Rolls • Wheels
and Other Hardened Products

BIG NEWS IN ALUMINUM!

48" Wide Embossed Industrial Corrugated

...For Lower Installed Cost, Improved Appearance!

All the advantages that have made Reynolds Aluminum Industrial Corrugated a sweeping success throughout industry... rust-proof permanence, lowest maintenance, high insulation... now at even lower installed cost and with improved appearance! With these new 48" sheets, side laps take 30% less metal, 30% fewer fasteners... and there are 30% fewer sheets to handle. With the new stipple-embossed finish, the wider-spaced laps tend to disappear... making a handsome, uniform, textured effect. Call on Reynolds for literature, technical and application details.

Offices in principal cities. Check your classified phone book for our listing under "Building Materials." Or write Reynolds Metals Company, Building Products Division, 2041 South Ninth St., Louisville I, Kentucky.

DESCRIPTION:

METAL THICKNESS: 0.032 inch (22 U.S. Std. Ga.)

FINISH: Embossed.

LENGTHS: 5', 5' 6", 6', 6' 6", 7', 7' 6", 8', 8' 6", 9', 9' 6", 10', 10' 6", 11', 11' 6", 12'. (Special lengths cut to order subject to inquiry.)

WIDTH: Over all width 48⅛", nominal coverage 45½", 1½ corrugations side lap.

CORRUGATION: Pitch 2.667" center to center, depth ⅞", 18 crowns, 18 valleys, one edge up, opposite edge down.

WEIGHT: 56 pounds per 100 square feet of formed sheet.

Standard .032" mill finish Industrial Corrugated also available—35" width, same lengths as above.

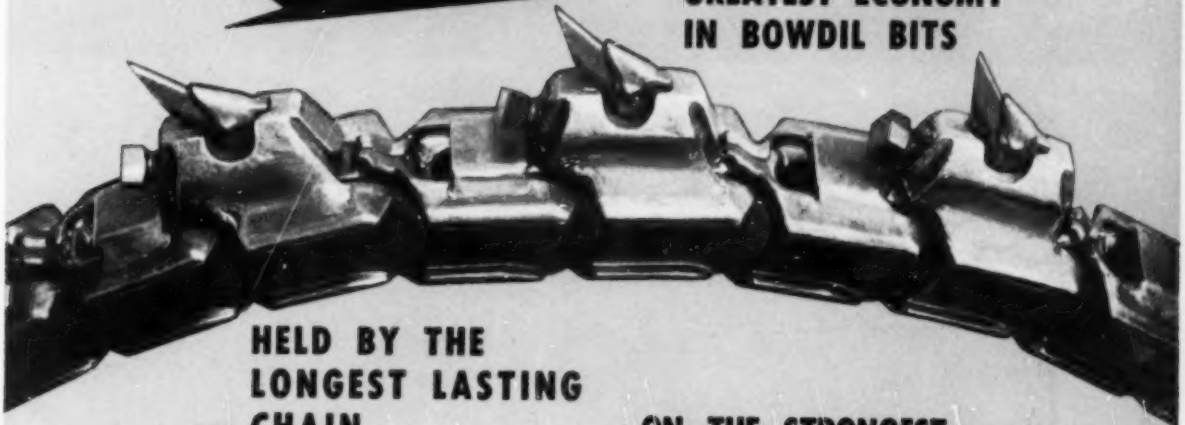
REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

SEE "MISTER PEEPERS," starring Wally Cox, Sundays, NBC-TV Network.

THIS IS THE POINT WHERE PROFITS BEGIN

$

YOU'LL FIND YOUR GREATEST ECONOMY IN BOWDIL BITS



HELD BY THE LONGEST LASTING CHAIN . . . . . ON THE STRONGEST CUTTER BAR MADE

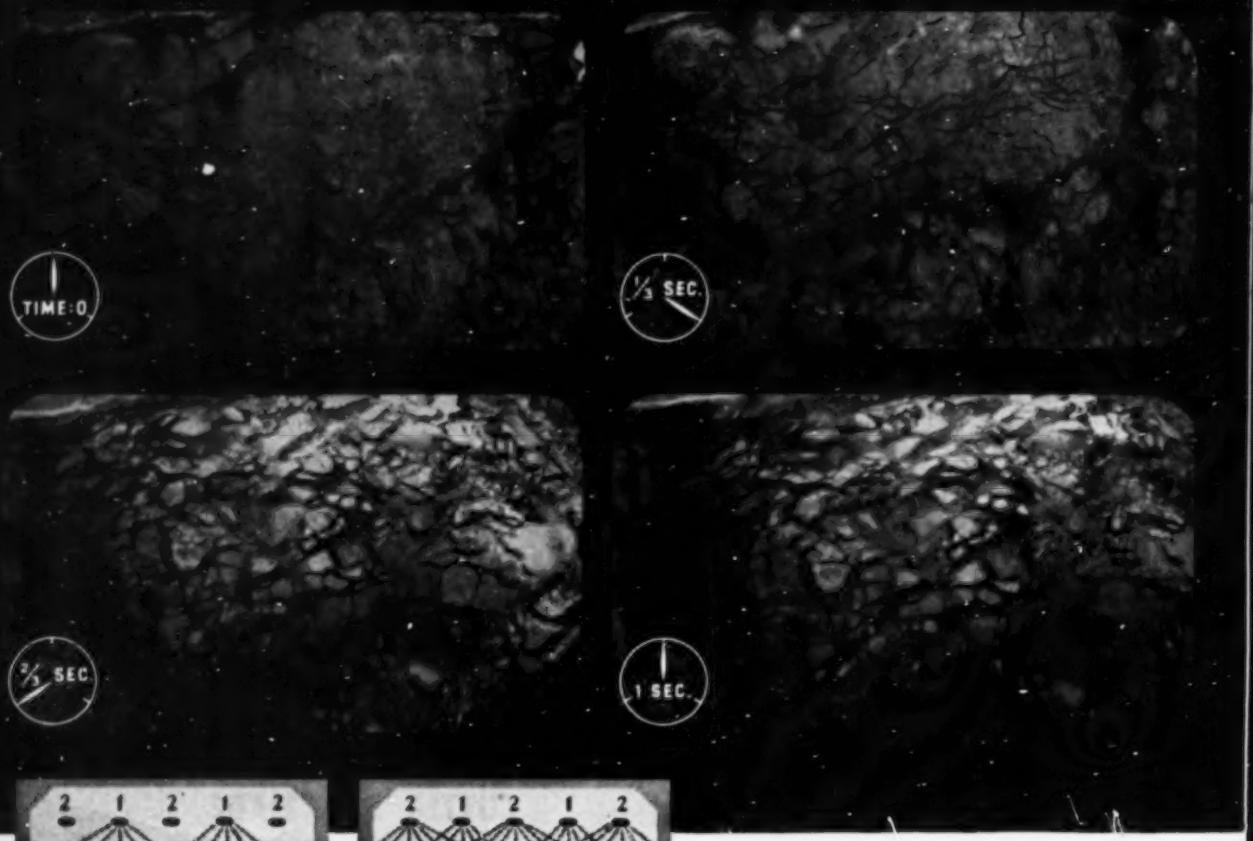
BOWDIL

COAL CUTTING EQUIPMENT

CANTON OHIO

the inside story

Here's how ROCKMASTER® gives better breakage



The first delays put the rock under stress. Then the number two punch of the second delays cuts across the lines of force at points of maximum stress giving maximum breakage.

THIS unusual sequence of photos shows explosives force, first swelling and then bursting a solid face of granite. It is visual evidence of the excellent breakage possible with the ROCKMASTER blasting system used in an alternate pattern.

Theory behind the breaking action of this pattern is that the first delays, detonating within definite limits of controlled timing, place the entire burden under stress. Then at the moment of maximum tension the second delays, also firing with controlled timing, throw the second punch which produces a wedging and bursting action throughout the burden. The explosives gases of alternate ROCKMASTER blasting can be kept under prolonged confinement, reducing both air blast and ground vibration to a minimum.

Alternate action cannot be duplicated by progressive milli-second delay firing methods or by any form of top detonation.

If you want to see how others have profited by using ROCKMASTER milli-second delay detonators with the ROCKMASTER system of explosives choice and loading methods, send for your free copy of the paper "Overburden Blasting Techniques."

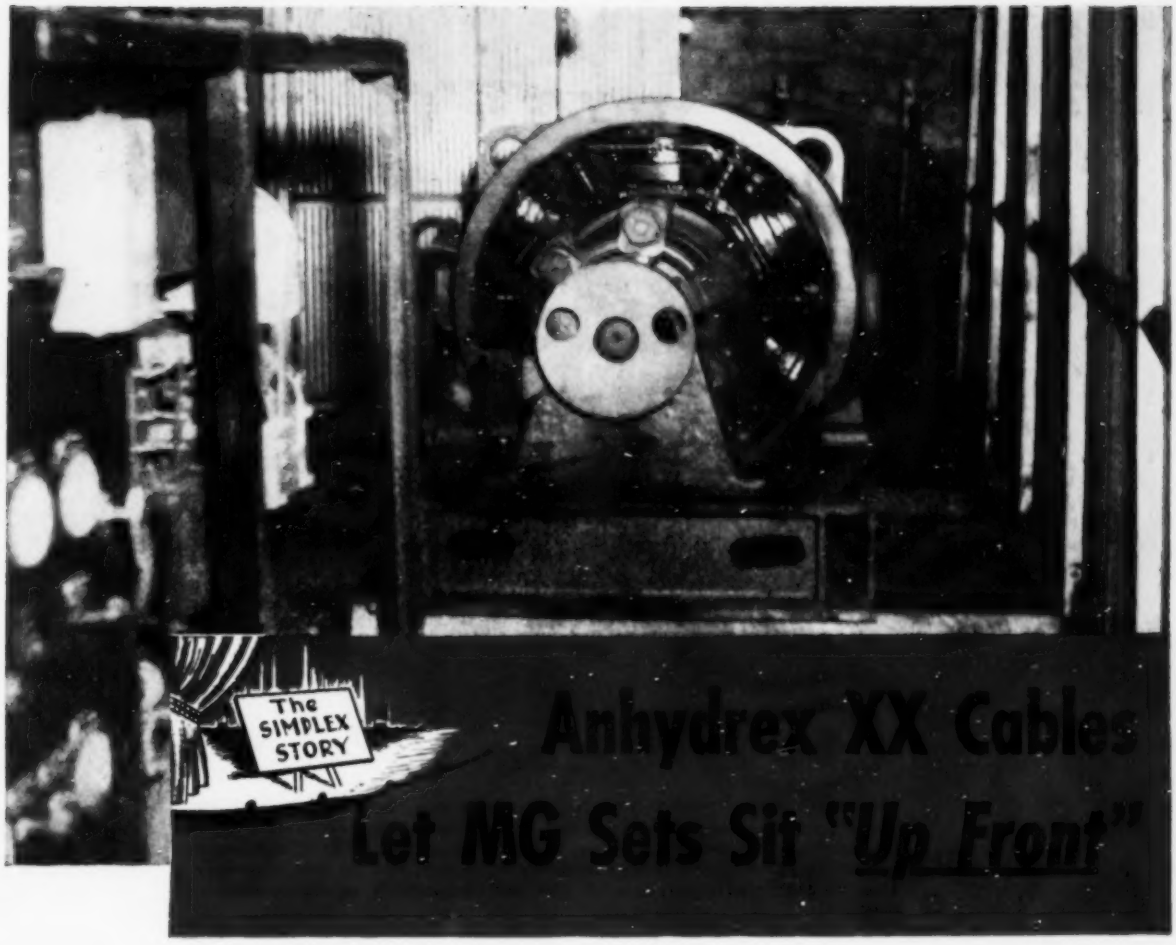
ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Offices in principal cities



Anhydrex XX Cables Let MG Sets Sit "Up Front"

Overheated motors, reduced production, machine slowdown, and increased maintenance are all part of the penalty you pay for excessive voltage drop in your low voltage feeder system. How can you prevent these costly delays and increase production? By keeping your motor generator sets or other conversion equipment as close to the face as practicable, thus keeping your low voltage feeders as short as possible.

This means that your high voltage cables will extend underground close to the face. For this kind of service you will need as good high voltage feeders as there are available, and that means Simplex-ANHYDREX XX Cables.

Simplex-ANHYDREX XX Cables have unusually high resistance to water-absorption, heat, ozone, and aging. They are easy to install and easy to take down. These features mean cable reliability, increased production, and lowered operating costs for you.

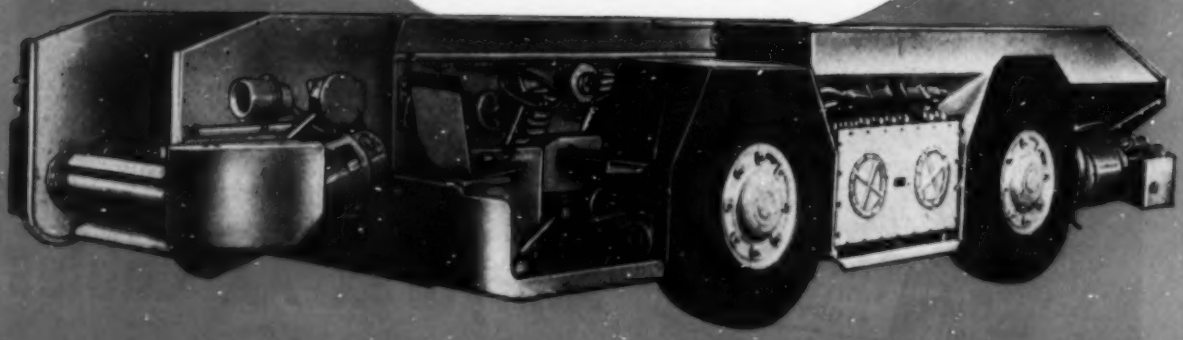
Why don't you investigate the possibilities of running your high voltage feeders underground and keeping your conversion equipment close to the face?

Simplex WIRES & CABLES

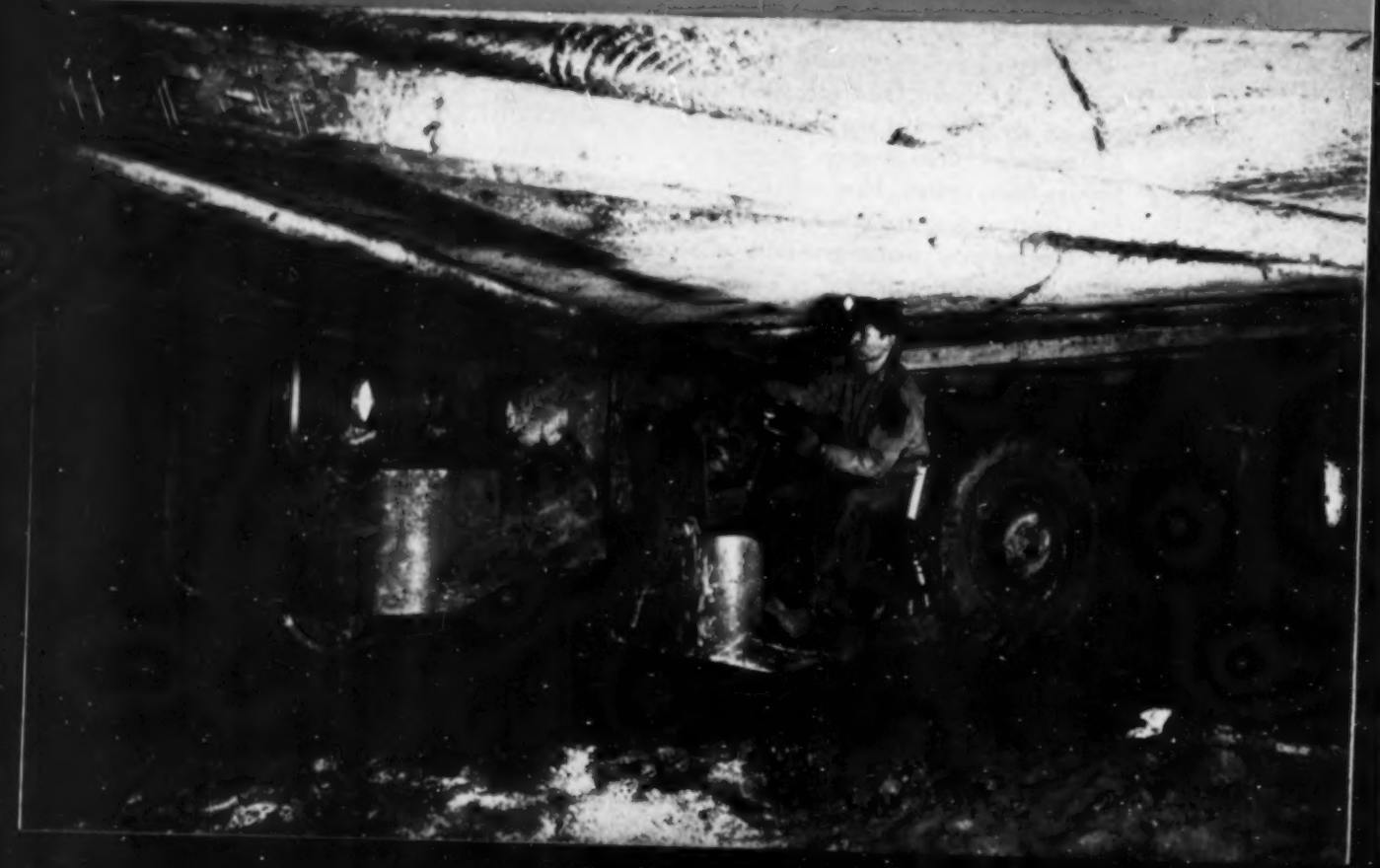
SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

THE JOY 10-SC SHUTTLE CAR...

1953 MODEL!



The improved Joy 10-SC Shuttle Car is available as a Permissible or Non-Permissible unit, for net payload capacities up to 10 tons. It is built in 43", 48" or 54" heights (machine only) and may be equipped with 4", 6" or 8" sideboards. Tramming speed loaded is approximately 4½ m.p.h., and the unit is equipped with Joy-pioneered hydraulic cable reel, and hydraulically adjustable elevating discharge.

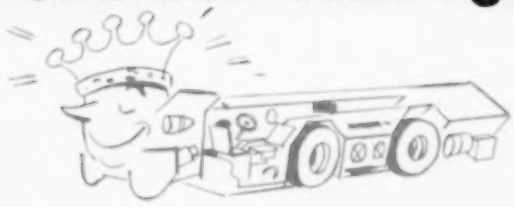


CAN MAKE MONEY FOR YOU!

It gets from the Face

to the Discharge

Point and back again



faster than any other car on the market

This latest model 10-SC is away out in front—more than ever before the world's leading shuttle car for heavy-duty, high-production service. Particularly ideal for full-seam mining because it can handle full loads of coal or rock with equal ease, the 10-SC Shuttle Car is now capable of new potentials in productivity, maneuverability, and dependable performance with lowest maintenance.

MORE ROUND TRIPS PER SHIFT

The 1953-model 10-SC can travel, discharge and return faster than any other car in its class. That means more pay-loads per shift—and it may also mean more efficient use of other equipment, such as Continuous Miners, Loaders, Belt Conveyors, etc.

15 HP traction motors of new design provide more dependability and more reserve power for increased speed, maneuverability and carrying capacity. Wheel units and brakes are of over-capacity size for continuous heavy-duty service, and the gearing and frame are also over-capacity. Higher speed conveyor discharge, with higher-HP motors, actually gets discharge time down to three-quarters or half the time formerly required.

OTHER JOY-PIONEERED FEATURES

The 1953-model 10-SC Shuttle Car has 4-wheel positive steering, 4-wheel drive and 4-wheel brakes. The hydraulic "power steering" innovation in the automotive world has been a standard patented feature of Joy Shuttle Cars for years . . . one of the reasons for their high maneuverability.

The 10-SC's smooth, grab-free disc-type brakes (the type widely used on aircraft) were also pioneered by Joy for underground use. They provide exceptional stopping power with extreme simplicity and low maintenance . . . ideal for mining use because they're unaffected by dirt, coal dust, oil or water.

Other features of the new 10-SC include: improved arrangement of operator's controls for fool-proof driving; improved "zone" lubrication for fast, easy servicing; the famous Joy "Magnetax" controls, etc.

● For full data, address ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada:*** *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

W&D 4585

Wire Rope at Work — Perhaps the most unusual building of our time is the State Fair Arena at the State Fair Grounds, Raleigh, N. C., shown here while construction was in progress. Startling in design, this steel-and-concrete structure is some 300 ft long by 300 ft wide, with sides that rise gracefully in perfect arcs. But its most striking feature is the gently-curved roof, which is supported entirely by Bethlehem steel cables.

Forming a grid with 6-ft x 6-ft squares, the cables, zinc-coated for resistance to corrosion, are securely anchored to the framework of the building and are fastened together at points of intersection. Bolt-clipped to the grid are corrugated metal sheets which, with the topping, constitute the roof proper. This ingenious application of steel cable—a member of Bethlehem's wire rope family—has already aroused wide interest and may well suggest a new trend in design and construction.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

ALLIS-CHALMERS BUILDS VIBRATING SCREENS

For *ANY* Coal Application!

AND BUILDS MORE SCREENS FOR THE COAL INDUSTRY THAN ANY OTHER MANUFACTURER!

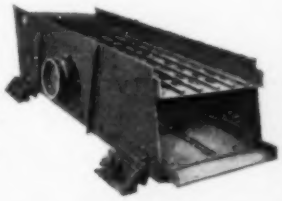
RUN-OF-MINE SCALPING

Extra Heavy Duty

RIPL-FLO

SCREEN

A heavily constructed 2-bearing inclined screen for scalping ROM ahead of picking tables or crushers. Floor mounted or suspended. 4x10 to 6x16 ft.

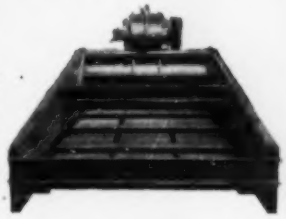


DEWATERING . . . SLUDGE RECOVERY

LOW-HEAD

SCREEN

Horizontally operating *Low-Head* screens are widely used for primary and secondary dewatering . . . and for the recovery of saleable coal from sludge. 3x12 to 6x16 ft. Send for Bulletin 07B6330A.

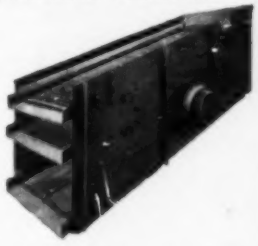


SIZING TO EGG, NUT, STOKER GRADES

RIPL-FLO

SCREEN

Used for wet or dry screening of raw coal ahead of washers . . . for preparing egg, nut, stoker sizes . . . for grading and rescreening crushed coal. Sizes 3x6 to 6x16 ft. Send for Bulletin 07B6151B.

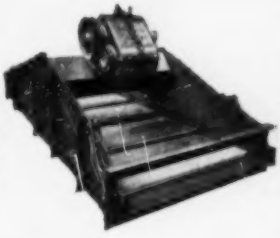


MEDIA RECOVERY

LOW-HEAD

SCREEN

Low-Head screens are used as media drain and wash screens for coal and refuse. Available with movable partitions to handle both products. 3x6 to 6x16 ft.

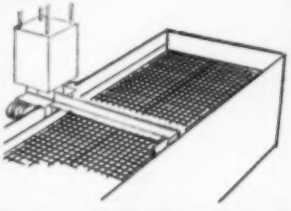


SIZING FINE MOIST COAL

THERMO-DECK

HEATING UNIT

Low voltage resistance heating of wire cloth eliminates troublesome blinding of moist fine coal. No downtime to clear the screen. Can be installed on A-C screens now in use. Bulletin 07B7812.

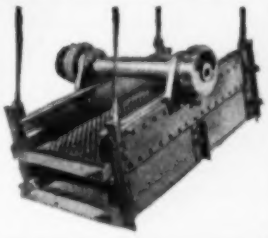


AUXILIARY SIZING AND DEWATERING

AERO-VIBE

SCREEN

Used for sizing coal or middlings following air cleaner, sludge dewatering, dewatering following chloride washer. Easy to install and operate. 2x4 to 5x10 ft. Send for Bulletin 07B6099.



A-3723

Low-Head, Ripl-Flo, Aero-Vibe, Thermo-Deck, Texrope are Allis-Chalmers *trademarks.*

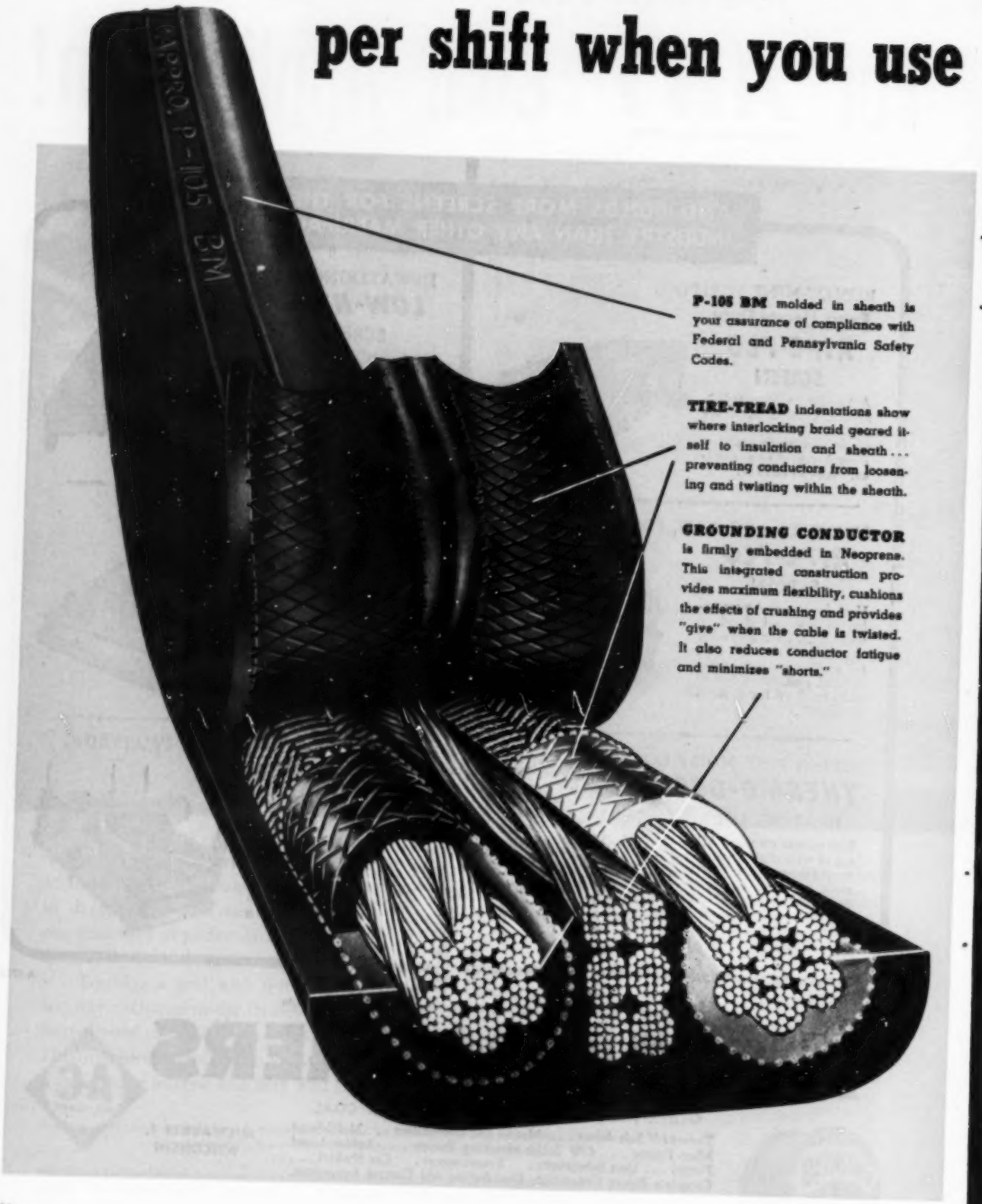
ALLIS-CHALMERS

OTHER ALLIS-CHALMERS PRODUCTS FOR COAL

Texrope V-belt drives . . . Motors and Gearmotors . . . Multi-Stage Mine Pumps . . . CW Solids-Handling Pumps . . . Rubber-Lined Pumps . . . Unit Substations . . . Transformers . . . Car Shakers . . . Complete Power Generation, Distribution and Control Equipment.

MILWAUKEE 1, WISCONSIN

Why you get more tonnage per shift when you use



P-105 BM molded in sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes.

TIRE-TREAD indentations show where interlocking braid geared itself to insulation and sheath . . . preventing conductors from loosening and twisting within the sheath.

GROUNDING CONDUCTOR is firmly embedded in Neoprene. This integrated construction provides maximum flexibility, cushions the effects of crushing and provides "give" when the cable is twisted. It also reduces conductor fatigue and minimizes "shorts."

Rome 60 Mining Cables

Firm interlocking braid prevents conductors from twisting or tearing away from tire-tough RoPrene sheath—minimizes cable failure.

If you want positive proof, do what we've done on the opposite page.

Peel back the tire-tough RoPrene (Neoprene) sheath from a Rome 60 flat twin (parallel duplex) Type G shuttle car cable. Note the indentations on the inside of the sheath and on the insulation of the conductors. Those were made by the sturdy interlocking braid as it geared itself to the insulation and sheath.

This braid prevents conductors from twisting or tearing away from the sheath even though subject to long-time twisting and bending under extreme tension.

Now, note the interlocking braid itself. See how it firmly embeds itself in the insulation of the conductors and in the sheath.

Note also that the grounding conductor is firmly embedded in a webbing of RoPrene (Neoprene). This gives maximum flexibility, cushions the effects of crushing and provides "give" when the cable is twisted.

It also reduces conductor fatigue and minimizes "shorts."

The heat-resistant rubber insulation offers exceptional overload protection, permits operation at 75°C.

Finally, the RoPrene (Neoprene) sheath itself is molded in lead to a tire-like toughness. It resists moisture, acids, oils, abrasion and flame. It is manufactured for heavy duty service.

You can minimize time-consuming splicing and down time, and increase tonnage per shift by standardizing on Rome 60 mining cables for all your mechanical equipment.

It Costs Less to Buy the Best!

For general mine and coal preparation plant power distribution and lighting, specify RoMarine-RoPrene® power cables.

Here is the ideal all-round cable for mine power distribution. Its tough RoPrene (Neoprene) sheath resists moisture, acids, oils, abrasions and flame. RoMarine is a specially compounded heat and moisture resistant insulation, suitable for operation up to 75°C.

Rome 60 line includes:

Type SO Portable Cords • Single Conductor Locomotive Cables • Concentric Mining Machine Cables • Twin (Parallel Duplex) Mining Machine Cables Types W and G • Multiple Conductor Portable Power Cables Types W and G • Multiple Conductor Combination Power and Control Portable Cables for specific applications • Mine Power Distribution Cables • Shovel and Dredge Cables.

ROME CABLE
Corporation
ROME • NEW YORK
and
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ROME CABLE ROME, N.Y.

ROME CABLE CORP., Dept. C-9, Rome, N. Y.
Please send me the Mining Cable Folder.

Name .....
Company .....
Address .....
City ..... State .....

A GOOD WELDING MACHINE IS IMPORTANT - BUT IMPORTANT JOBS DEPEND ON

GOOD PIPE

NO matter how intricate the weld, you do it readily with Youngstown pipe.

That's because Youngstown pipe is designed and made for easy welding—truly round, uniform in wall thickness, uniformly sized, and chemically and metallurgically right. The name "Youngstown" rolled into a length of pipe means it is GOOD PIPE.

QUALITY V YOUNGSTOWN SERVICE

7 POINTS OF UNIFORM GOODNESS IN

YOUNGSTOWN STEEL PIPE

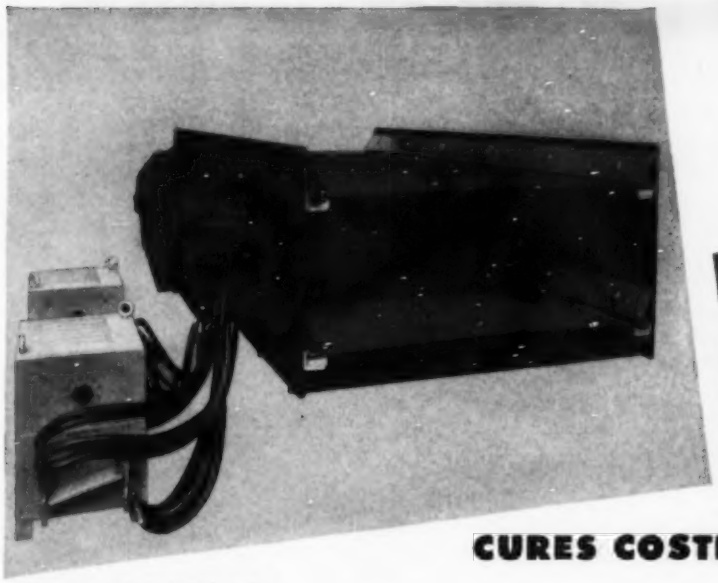
- uniform ductility
- uniform lengths
- uniform threading
- uniform weldability
- uniform wall thickness and size
- uniform strength and toughness
- uniform roundness and straightness

Youngstown STEEL PIPE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES



HEATING NOT BEATING

CURES COSTLY SCREEN BLINDNESS

photo courtesy of Hewitt-Robins, Inc.

The practice of beating blinded screens, a temporary cure at best, runs up labor cost and causes excessive screen failure. Hanco Screen Heaters forever eliminate costly, inefficient sizing resulting from blinded screens.

SCREEN HEATING REDUCES SIZING COSTS

1. Labor cost is cut by elimination of cleaning labor!
2. Screen life is greatly extended for it is no longer damaged by manual cleaning!
3. Sizing is more accurate and faster for processing equipment can be operated at full capacity!

(Every Hanco installation has paid for itself in less than a year!)

EASY INSTALLATION ON ALL SCREEN MAKES

Hanco electric screen heaters are furnished as a complete kit—heater unit, lead cables, copper distribution and feed bars and skirt boards. All necessary small parts and complete instructions are included. Hanco units are designed to match original fittings. Speedy installation can be made by competent maintenance personnel.

HANCO QUICK-CHANGE ASSEMBLY

Available in five styles, Hanco quick-change assemblies assure easy cloth changes. Special skirt boards or tension rails incorporate a wedge type copper distribution bar that is bolted to but insulated from the rail itself. One of the five assemblies shown below is sure to fit your make of screen. Cloth changes are as easy or easier than on an unheated screen.

A-8014

HANCO SCREEN HEATER ADVANTAGES

1. Hanco heaters have a wide application for they heat brass, plain, stainless and monel steel screens.
2. Unique tap changing device allows screen temperature adjustment under load. This means added economy, for you can quickly adjust to seasonal or load demands.
3. Heater terminals are readily accessible for inspection or adjustment.
4. Compact heater units can be floor, wall or ceiling mounted.
5. There is always positive direct contact with the hook strip of the screen cloth.
6. All electrical contacts are shielded from abrasion.
7. Cloth changes are as quick and easy as they are on unheated screens.

HANCO HEATERS ARE AVAILABLE ON MOST NEW SCREEN EQUIPMENT

Send today for descriptive bulletin

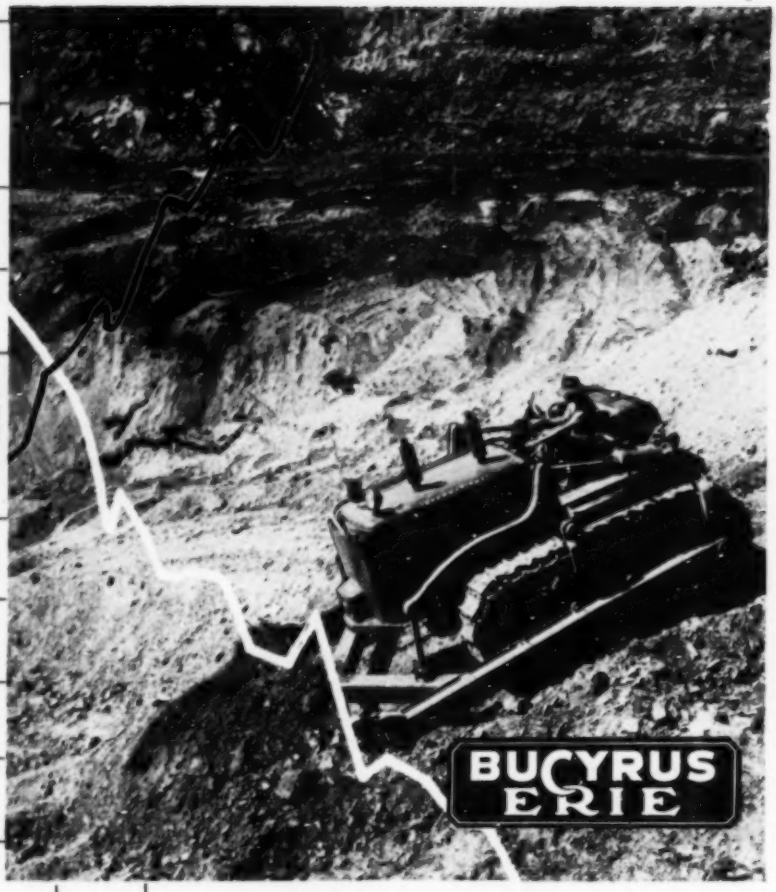
Hanco

the pioneer electric screen heater

F. R. HANNON & SONS • CANTON 7, OHIO

Engineers & Manufacturers Since 1926

BUILT TO PUSH PRODUCTION UP . . . COSTS DOWN



Bucyrus-Erie Bullgraders and Bulldozers for International Tractors

Here's Why You PRODUCE MORE . . .

BIGGER LOADS WITH LESS POWER because scientifically curved moldboard *rolls* dirt instead of pushing it — there's less load resistance so you handle bigger loads with the same tractor power.

FULL TRACTIVE EFFORT is assured because original tractor balance remains practically unchanged when Bucyrus-Erie blade is mounted — tracks *stay* on the ground to take advantage of all the tractor power.

BETTER BLADE CONTROL with either hydraulic or cable controls helps the operator make smoother, more accurate cuts — lets him move more in fewer passes.

Here's Why Your COSTS GO DOWN . . .

TOUGH, WEAR-RESISTANT STEELS add extra life to Bucyrus-Erie blades.

PROPER WEIGHT AND STRESS DISTRIBUTION eliminates unnecessary strain on tractor parts — you'll have less downtime and longer wear on tractor parts.

EFFECTIVE USE OF TRACTOR POWER cuts the cost per yard moved.

Your nearby INTERNATIONAL Industrial Tractor Distributor can give you all the facts on the advanced features of Bucyrus-Erie blade equipment for International crawler tractors . . . see him soon.

Choose either hydraulic or cable controlled Bucyrus-Erie Bullgraders or bulldozers for International tractors. 30753

INTERNATIONAL HARVESTER

See your **INTERNATIONAL** **INDUSTRIAL TRACTOR DISTRIBUTOR**

BUCYRUS-ERIE COMPANY | SOUTH MILWAUKEE WISCONSIN

COMPTON Model 36 Coal Auger

designed for { Maximum recovery ...at Minimum cost

The new Compton Model 36 Coal Auger is the answer to the demand for rapid, economical high wall recovery in small, narrow pits. Only 36 feet long and weighing approximately 25 T., the Model 36 includes all the design advantages of the other Compton Coal Augers.

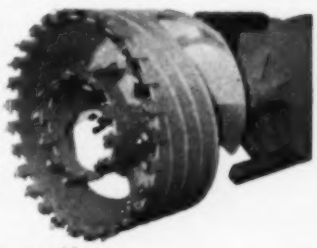
- Convenient, accessible auger sections racked on the frame.
- Synchronized winches for handling auger sections.
- Hydraulically operated pilot pan eliminates spillage between machine and highwall.
- Elevating conveyor is integral part of machine.
- Hydraulically-controlled swiveling discharge chute permits uniform trimming of trucks.
- Hydraulic jack legs (with self-leveling pontoons for better floatation) allow drilling up to 160 feet without misalignment.
- Single or vertical overlapping holes can be drilled in varying coal seam thickness.

The Compton Model 36 Coal Auger paves the way to higher quality through selective mining! Up to 60 Tons per hour recovered in actual production tests! Plan today to expand your present or future developments with Compton Coal Augers.

(Write for details about other Compton Auger Models 42, 48 and 56.)

Model 36 SPECIFICATIONS

Length: 36 *feet* *Weight: Approx.* 25 *T.*
Carries eight 20 *ft. auger sections*
Required pit width: 38 *feet min.*
Power: 150 *hp Diesel engine*
Hydraulic Frame Jack Lift: 54 *inch*
Auger Diameters: 24 *inch to* 94 *inch*
Possible Drilling Depth: 160 *feet*



The Compton Cutting Head — non-clogging type with a built - in spider bearing assembly — increases production by drilling straighter holes with less frictional drag.

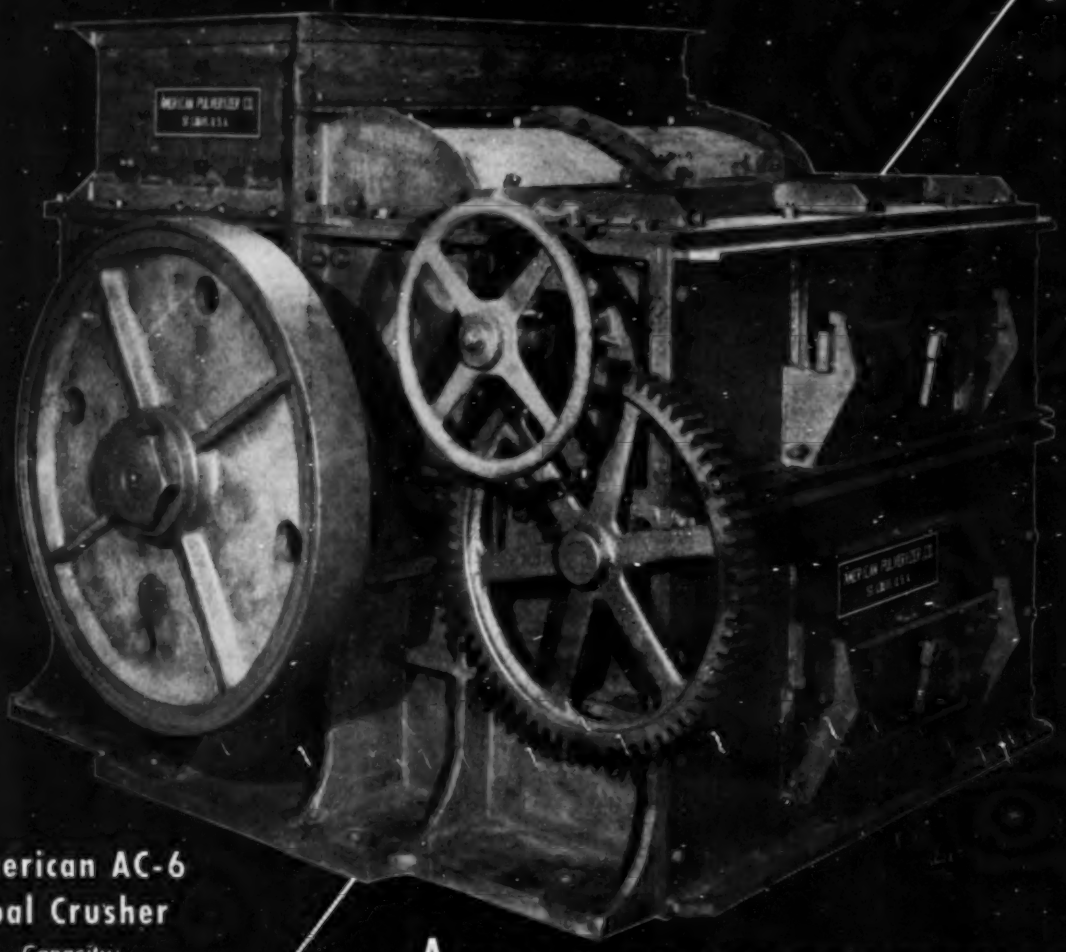
Consult a Compton Engineer for Details

Compton, Inc.

ORIGINATORS OF COMPTON LUMP RECOVERY GEARS

BOX 1946 – PHONE 4-6384 CLARKSBURG, WEST VIRGINIA

QUALITY CLEAR THROUGH...



American AC-6 Coal Crusher

Capacity:
300 tons per hr.
ROM to 3/4"

American Crusher quality is being constantly reaffirmed by case histories coming in from power plants, central stations and mines throughout the country . . . records which are proving beyond a doubt American's superlative performance and economy of operation. Here, for example, are the

Cost Surveys of 29 American Installations

Total Tonnage Handled	61,000,000 Tons
Average Age of Crushers	9.5 Years
Replacement Parts (Includes Standby Parts)	1/10 of 1¢ per Ton

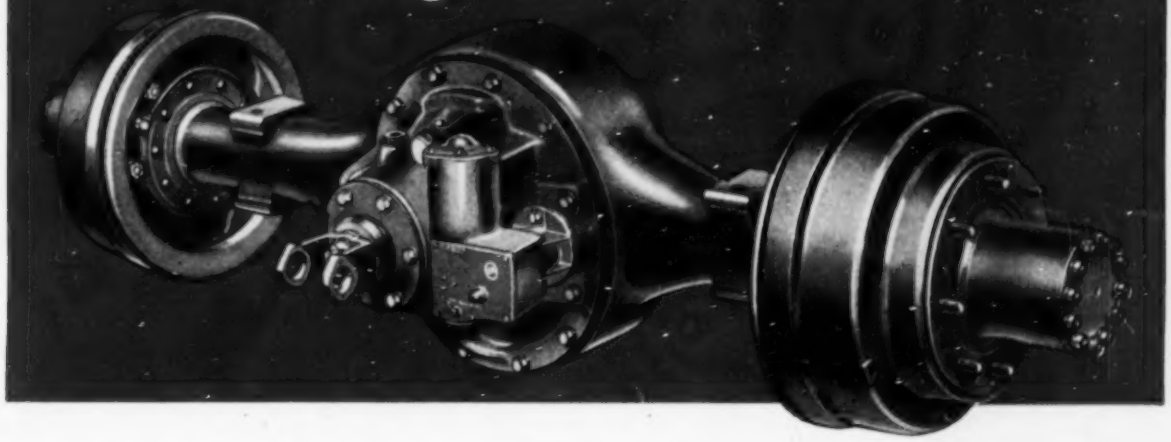
THERE CAN BE NO BETTER PROOF OF QUALITY!

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE., ST. LOUIS 10, MO.

With Eaton 2-Speed Axles, a cost-cutting gear ratio for every road and load



More than a million-and-a-half Eaton 2-Speeds in trucks today!

Eaton 2-Speeds enable drivers to select the right gear ratio for every operating condition—starting out under full load, climbing grades, high-balling, quick shifting in traffic. Engines operate in their most efficient speed range, reducing stress and wear on vital truck parts. Operating and upkeep costs are at a minimum; trucks last longer, are worth more when traded in. Ask your dealer to explain how Eaton 2-Speed Axles give trucks power when needed, speed when wanted.

EATON

AXLE DIVISION

MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

If you do this to a cable...

you'll want *flexible* G-E Type SH-D

When you're trying to get out the maximum tonnage each hour, cables usually take a beating. Bending, pulling, and crushing of portable cables are common causes of cable failure. To meet these conditions, use G-E Type SH-D Geoprene portable cable. With this cable you'll obtain longer cable life with consequent low replacement cost—what's more, you'll obtain easier handling and increased protection to equipment and personnel. General Electric's Type SH-D construction contains unique features of flexibility and durability which best protect this type of cable against the service abuses encountered.

Its flexibility means long life and protection to equipment and personnel

The ground wires are minutely stranded with a short lay for maximum flexibility and are approximately equal in total cross section to one main conductor. Each is encased in braid so that, when bent, the wires will slide rather than break. As a result, this cable has never, to our knowledge, had a single case of failure from broken ground wires. This flexibility and the large cross-sectional area of the ground wires reduce the hazards of faults.

The shielding is a combination cotton and copper braid which is more flexible and therefore less subject to breakage than an ordinary all-copper braid. Yet it has a copper content that gives full shielding protection against corona.

The treated jute fillers permit internal movement of the conductors to relieve strains caused by bending.

All of these features of flexibility make the cable last longer, and make it easier to handle and to move.

Its durability prolongs cable life

The strength, toughness, and resistance to fire, oil, and corrosives of Geoprene cables have been proved by many years of service. Also in G-E Geoprene Type SH-D cables the inner and outer jackets and the reinforcing corded mesh are bonded together like a reinforced tire for maximum resistance to pulling stresses, crushing, and abrasion—and for longer cable life.

For uninterrupted operation of shovels, draglines, loaders, and other heavy portable equipment, and to reduce cable replacement costs—investigate G-E Geoprene Type SH-D portable cables. General Electric has a full line of wires and cables to meet the needs of the mining industry. For more information, write Section W105-914, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

You can put your confidence in—

GENERAL ELECTRIC

1876 75 1951 YEARS OF ELECTRICAL PROGRESS

control impact and abrasion with

AMSCO AW-79

FOR AUTOMATIC HARDFACING

A new chrome-moly electrode for submerged arc welding equipment

Excellent for rebuilding and hardfacing tractor rollers and idlers, back-up rolls, crusher rolls, steel wheels, sheeting rolls, as well as dozens of other applications. For complete metallurgical information and technical data, write Amsco, Chicago Heights, Illinois.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

409 East 14th Street - Chicago Heights, Ill.

OTHER PLANTS: NEW CASTLE, DEL.; DENVER; OAKLAND, CAL.; LOS ANGELES; ST. LOUIS. IN CANADA: JOLIETTE STEEL DIVISION, JOLIETTE, QUE. AMSCO WELDING PRODUCTS DISTRIBUTED IN CANADA BY CANADIAN LIQUID AIR CO., LTD.

Dewater Coal Fines with Eimco Filters

This photograph shows an Eimco Agidisc test filter unit which is available for pilot plant filtration work in your own processing plant.

This test filter incorporates all the features which enable Eimco's full production size machines to give that all around superior performance.

Tank agitation for uniform cake build up, all metal, high-drainage sectors, metal filter cloth, rubber scrapers, automatic valve, vari-speed drive and many other production unit advantages are built into this test unit.

For information on use of this equipment, write today to The Eimco Corporation, Salt Lake City, Utah.

Coal fines washed out of mine run coal in the cleaning plant represent a product worth saving both in quantity and quality.

Many companies in coal mining districts all over the Country are finding that compliance with anti-pollution laws is actually going to return them a profit.

Eimco filters used in dewatering coal fines have been selected by most progressive companies because: (1) Eimco offers the only reliable, heavy-duty unit for the job that is simple and free of trouble making gadgets. (2) Eimco's will operate continuously with a minimum of attention. (3) Cakes on Eimco filters are smooth and uniformly dried over the entire surface. (4) More tonnage is filtered per square foot per hour. (5) Eimco discs and Agidisc occupy less floor space per square foot of filter area. (6) Better filter bag life, and many other advantages.

Write for more information.

EIMCO A481

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment

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For top maintenance—depend on "U. S." Tape!

FRICTION, RUBBER and PLASTIC

SECURITY® FRICTION TAPE

For electrical and general purpose jobs. This is the strong, tacky tape that really grips and stays on. The fabric has unusually high tensile strength to handle tough jobs. Straight-tearing, non-ravelling. No pinholes to cause leaks. Rely on Security to stay on. Available also in specification grade—U.S. Holdtite®—exceeds A.S.T.M. specifications.

SECURITY RUBBER TAPE

For all general electrical work. This unvulcanized rubber splicing compound has the necessary physical properties: tensile strength, elongation, tackiness, plus the dielectric strength needed for durable splices. It is easy to handle and will fuse into a solid mass without heat or undue pressure. Available also in a specification grade—U.S. Holdtite—exceeds A.S.T.M. specifications.

ROYALASTIC PLASTIC TAPE

Does the work of both rubber and friction tape in many uses. This is the tape many maintenance men find best for making a thin splice and keeping wiring neat and uncluttered. Complete mechanical and electrical protection. High tensile strength and excellent resistance to abrasion and to water, oils, acids, alkalies and corrosive chemicals. Good stretch... clings tightly... strips cleanly.

United States Rubber Company is a single source for industrial tape. Simplify your purchasing by using one line. See your distributor or contact any one of our 25 District Sales Offices.

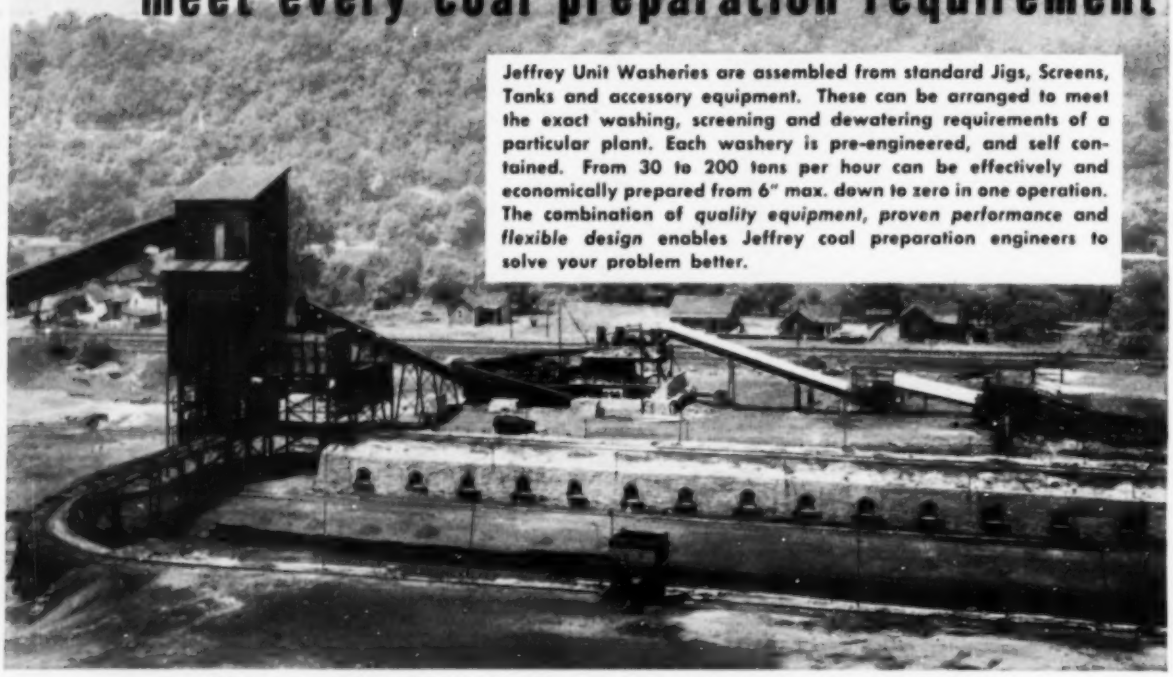
UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

JEFFREY UNIT WASHERIES

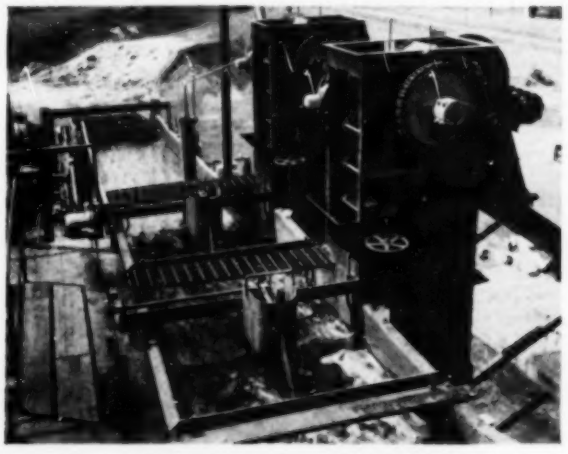
meet every coal preparation requirement

Jeffrey Unit Washeries are assembled from standard Jigs, Screens, Tanks and accessory equipment. These can be arranged to meet the exact washing, screening and dewatering requirements of a particular plant. Each washery is pre-engineered, and self contained. From 30 to 200 tons per hour can be effectively and economically prepared from 6" max. down to zero in one operation. The combination of *quality equipment, proven performance* and *flexible design* enables Jeffrey coal preparation engineers to solve your problem better.



Bird's eye view of Bridgeview Coal Co. Preparation Plant under construction at Gray's Landing Pa.

Jeffrey No. 200 Unit Washery being installed, showing entire installation from pushwater box to screens.



Closeup showing 2-compartment Jeffrey Diaphragm Jig discharging 6" round x zero coal to dewatering and sizing screens.

Write for Catalog 815-A

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

POCO HTB GREASE

hangs on through HEAT and WET!

Proves usefulness over wide range of temperature and moisture conditions.

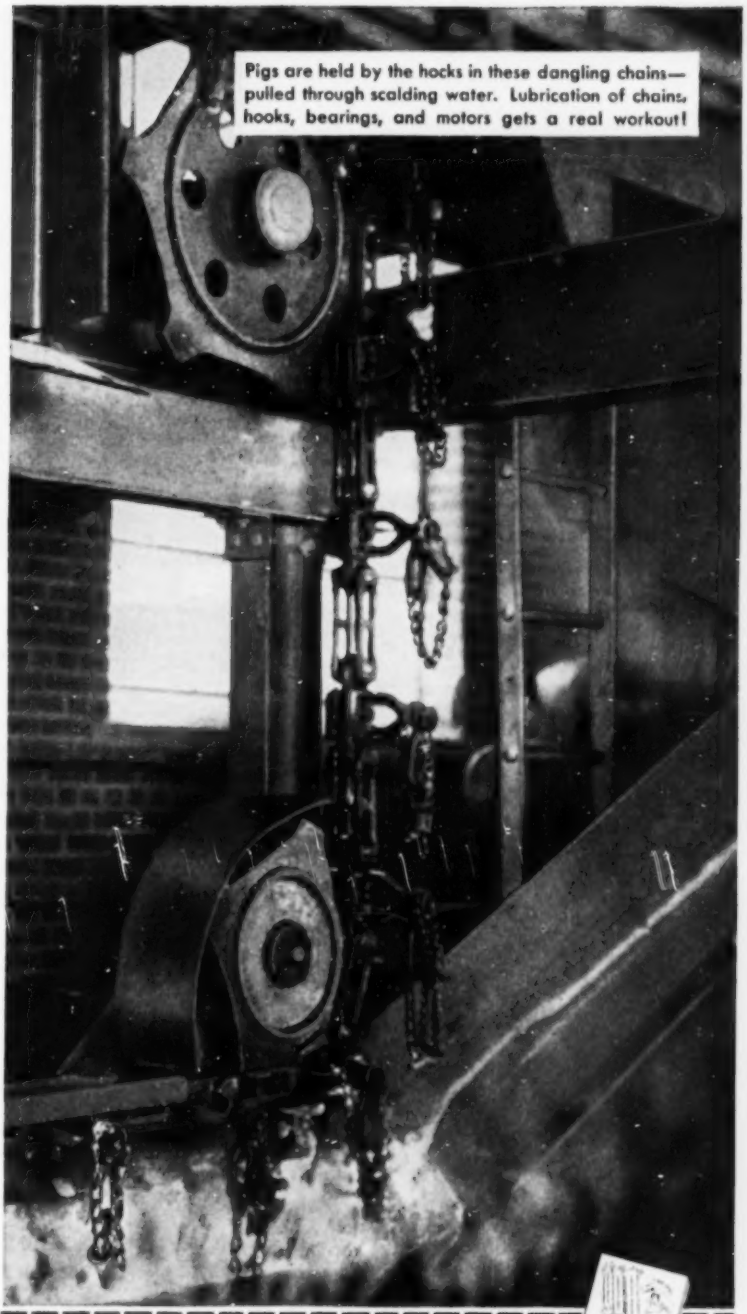
In meat packing plants, as in many others, POCO HTB Grease is widely used with outstanding success as a general purpose lubricant. High film strength and adhesiveness over a wide range of temperature and moisture conditions make this possible.

POCO HTB is one of a group of Pure Oil multi-purpose industrial lubricants that you can turn to advantage to simplify your lubrication practice—and reduce your lubricants inventory.

Find out more about this versatile compact line of oils and greases designed to do so many jobs equally well. In most plants no more than six lubricants are needed to do the entire lubrication job with complete success. By reducing the number of lubricants used in your plant to six or less, you can slash application costs, minimize waste and error.

Tear out that coupon now and mail it today. You'll get full details on how to start a new labor-saving, money-saving, lubrication program in your plant.

KEEP IT PURE, AND SIMPLE!



Pigs are held by the hocks in these dangling chains—pulled through scalding water. Lubrication of chains, hooks, bearings, and motors gets a real workout!

PURE OIL INDUSTRIAL LUBRICANTS

FREE BOOKLET

The Pure Oil Company, Industrial Sales Dept. C-39
35 E. Wacker Drive, Chicago 1, Illinois

Please send me your free booklet on how to "Simplify and Save".

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Be sure with Pure Sales offices located in more than 500 cities, including: Atlanta ... Birmingham ... Charleston ... Charlotte ... Chattanooga ... Chicago ... Columbus ... Indianapolis ... Jacksonville ... Madison ... Memphis ... Miami ... Milwaukee ... Minneapolis ... Pensacola ... Pittsburgh ... Richmond

Even the coal enjoys the trips

Here are two more examples of Bethlehem prefabricated trackwork, both installed by companies that mine a lot of coal. The systems use heavy-duty rail; have long, high-speed straightaways, fine turnouts, and curves that were properly calculated before a rail was cut or laid. On track like this, the loads move smoothly; even the coal enjoys the trips!

It's the kind of track that gives a lift to haulage systems. Trips are faster and safer; a greater volume of traffic can be handled without snarls or tie-ups.

You can't see all the details in the pictures, of course, but some are easy to spot. Note how snugly the switch points fit against the stock rails. And how neatly the rails butt against the frog arms. And note, too, that there are no wide gaps between rail ends. Small details like these take careful planning, careful building—the sort you get in every Bethlehem track job.

Bethlehem prefabricated mine track is furnished with rails cut and curved. Holes are drilled for joint bars. Turnouts are complete and ready for quick assembly. Nothing is left to buy; the layout includes all switch stands, rail braces, guard rails, and other accessories.

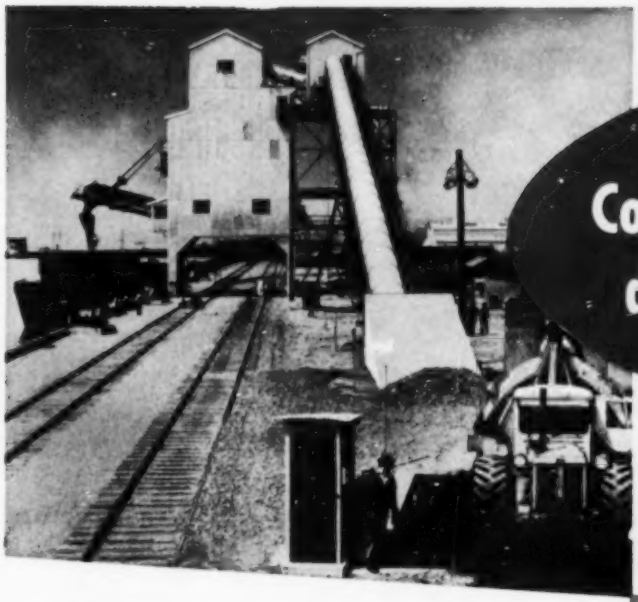
Why not talk with our engineers? They're mining men, like you, and they specialize in track and haulage problems. When it is time to expand or revise your present layout, they can be helpful to you. Call or write us for more details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM PREFABRICATED TRACK



New Coal Handling System designed for today

...and tomorrow

by HEYL & PATTERSON

WHEN formulating plans for their new Northeast Coal Storage Yard, engineers of the Philadelphia Electric Company planned for the future when the new yard will probably require unloading equipment to supplement the facilities at nearby locations.

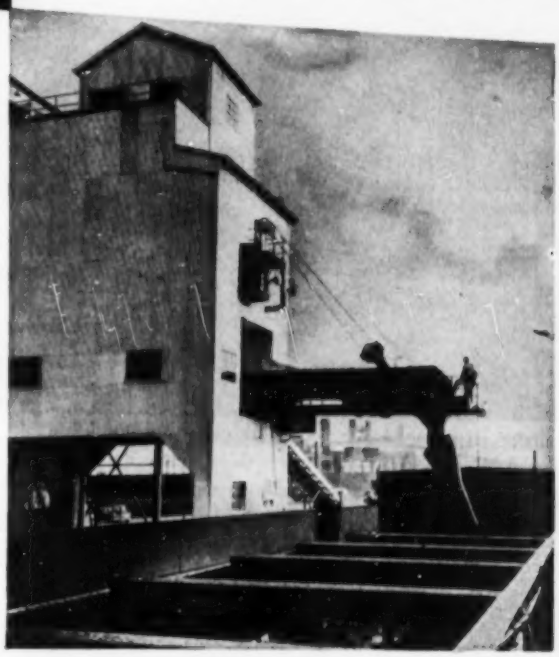
Heyl & Patterson designed, fabricated and erected this modern coal handling system that handles today's needs with precision and efficiency . . . and is also designed to fit in with plans for future requirements.

This coal handling system illustrates the constant aim of Heyl & Patterson . . . to work hand-in-hand with the customer to provide the very best Heavy Bulk Materials Handling Equipment to answer the customer's particular needs.

When *your* problem centers around the handling and transportation of coal, ore, limestone or any Heavy Bulk Material . . . take advantage of the complete engineering, fabricating and erecting facilities of Heyl & Patterson. Think first of Heyl & Patterson . . . with over 65 years experience in the specialized field of Heavy Bulk Materials Handling.

TOP PHOTO . . . Coal being reclaimed at Philadelphia Electric Company's Northeast Coal Storage Yard is dumped into a sunken hopper and carried by means of a belt conveyor to the top of the loading tower where it is deposited into a 250-ton-capacity storage bin. The coal is then fed from the storage bin either to the barge loader or into railroad cars or rubber-tired mobile equipment.

A series of lights in the operator's station indicates the amount of coal in the hopper at all times. The entire system is automatically "tripped-out" by the "full" indicator.



SHOWN HERE . . . Barge loading at 800 tons per hour is accomplished by a 37′ loading boom which can be raised or lowered to meet all barge-loading conditions. Barges are trimmed by the swinging chute at the discharge end of the loading boom.

All conveyors and gates of the conveying system are interlocked to prevent "pile-ups" in case of failure in any part of the system.

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- Boat Loaders & Unloaders
- Coal Storage Bridges
- Coal Preparation Plants
- Cyclone Thickeners
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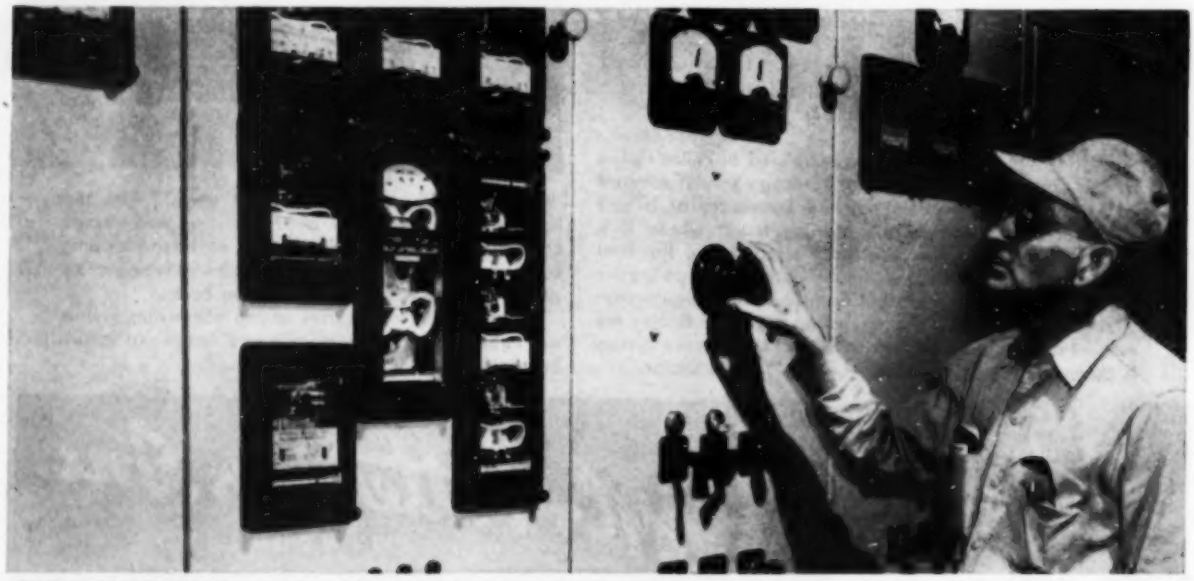
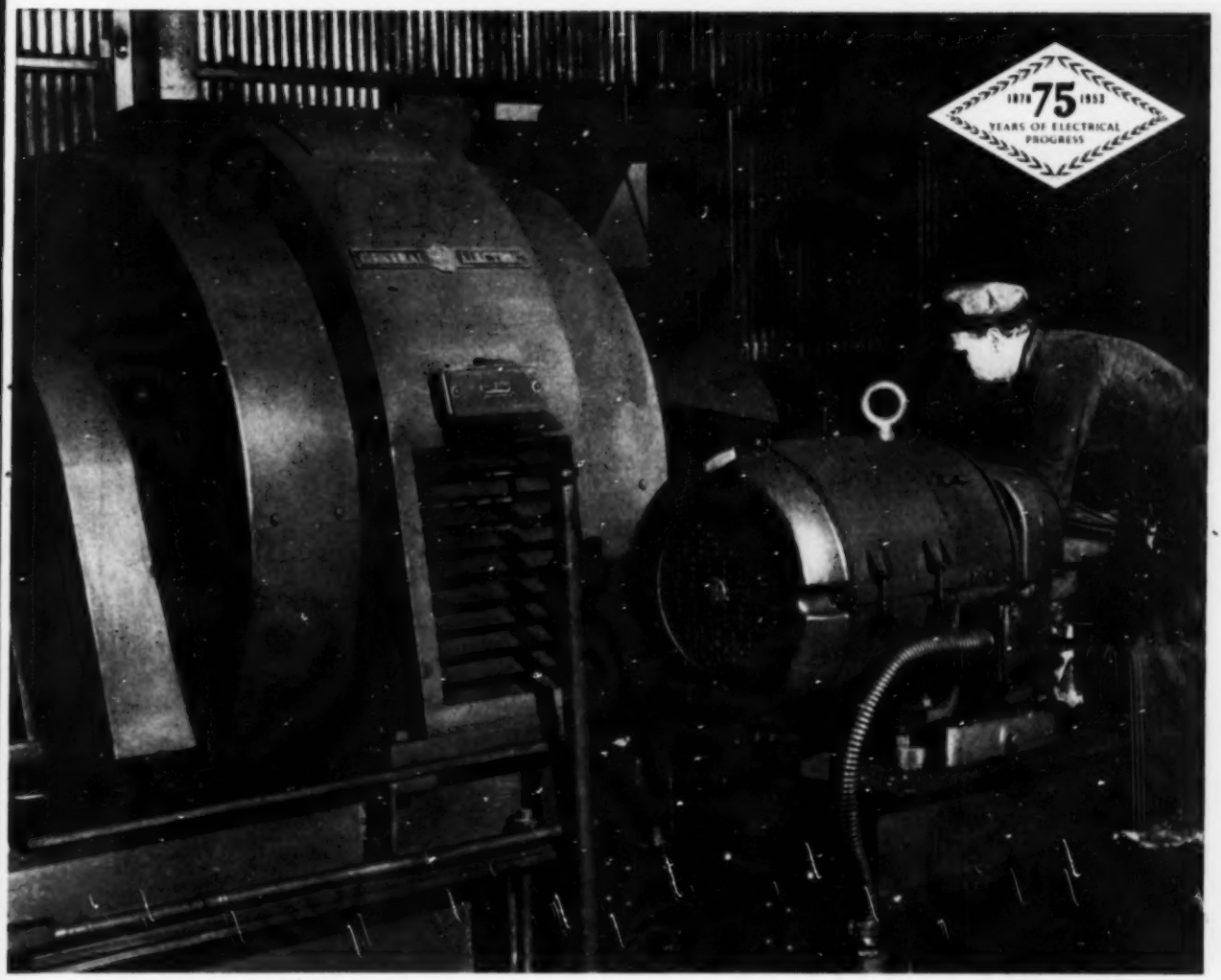
55 FORT PITT BLVD. PITTSBURGH 22, PA.

HIGHEST-LIFT CONVEYOR hauls coal up a 16-degree slope to preparation plant at C. W. & F.'s Orient No. 3 Mine. A G-E drive moves the 42-in. wide belt 625 feet per minute, handles 1200 tons per hour.



CENTRALIZED CONTROL—middle cabinet controls conveyor motor; cabinet at right controls motor when driven as generator.



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Record conveyor powered by G-E drive

WORLD'S HIGHEST-LIFT SINGLE-BELT CONVEYOR is located at the Chicago, Wilmington & Franklin Coal Company's Orient No. 3 Mine in Illinois. This Link-Belt conveyor carries coal up a 16-degree slope—lifts 868 feet in one 3290-ft continuous flight. The 42-in. wide belt operates at 625 ft per min, handles 1200 tons per hour. A General Electric drive was chosen for this conveyor because: first, the reliability of the motor and control permits regulated starting and selected speed operation. Second, the synchronous motor has important power factor correction ability, and third, G-E system engineers helped co-ordinate the drive for easy starting, minimum maintenance, greater safety.

Another factor in the selection of a G-E drive for this unusual conveyor was G.E.'s many years of experience powering more conventional conveyors. This experience is at your service. Your nearby G-E Apparatus Sales Representative can tell you more. General Electric Company, Schenectady 5, N. Y.

Engineered Electrical Systems for Coal Mines

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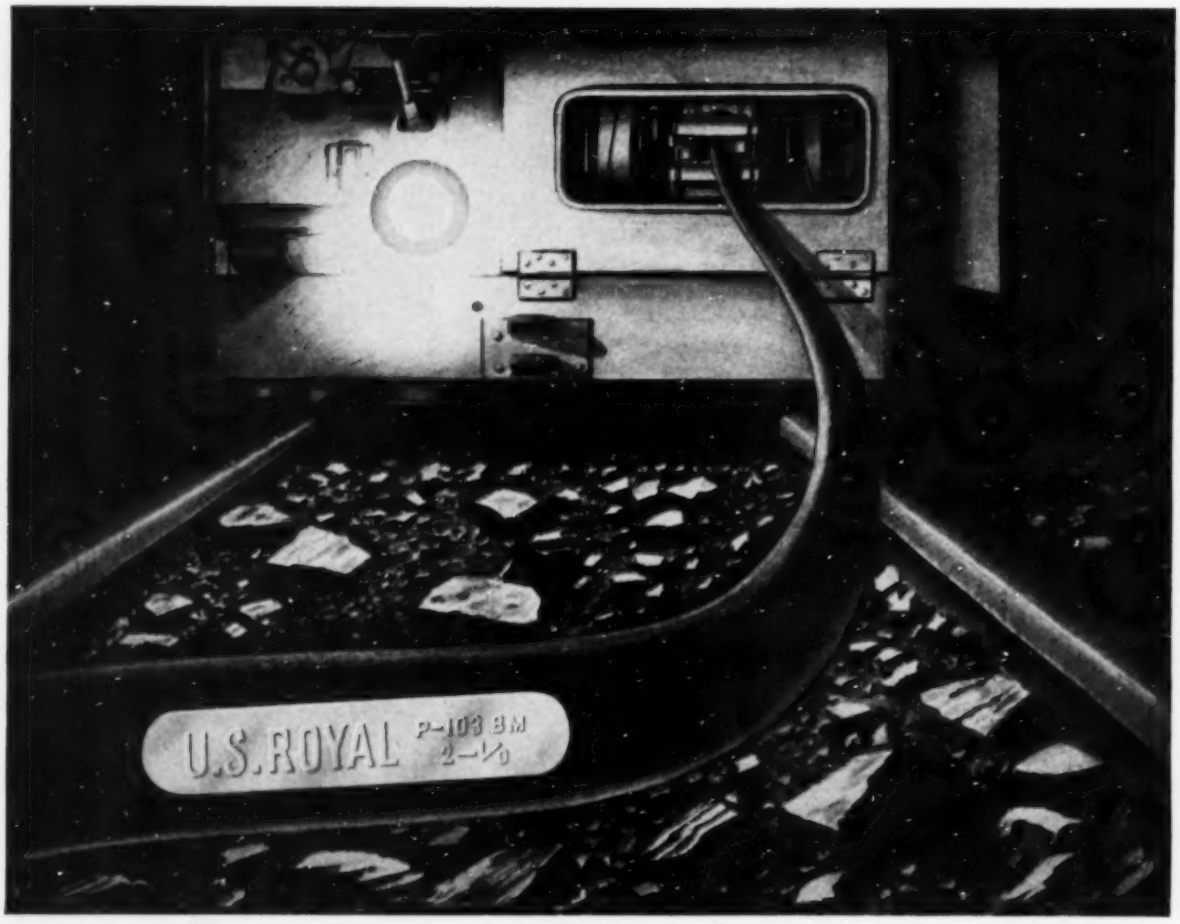

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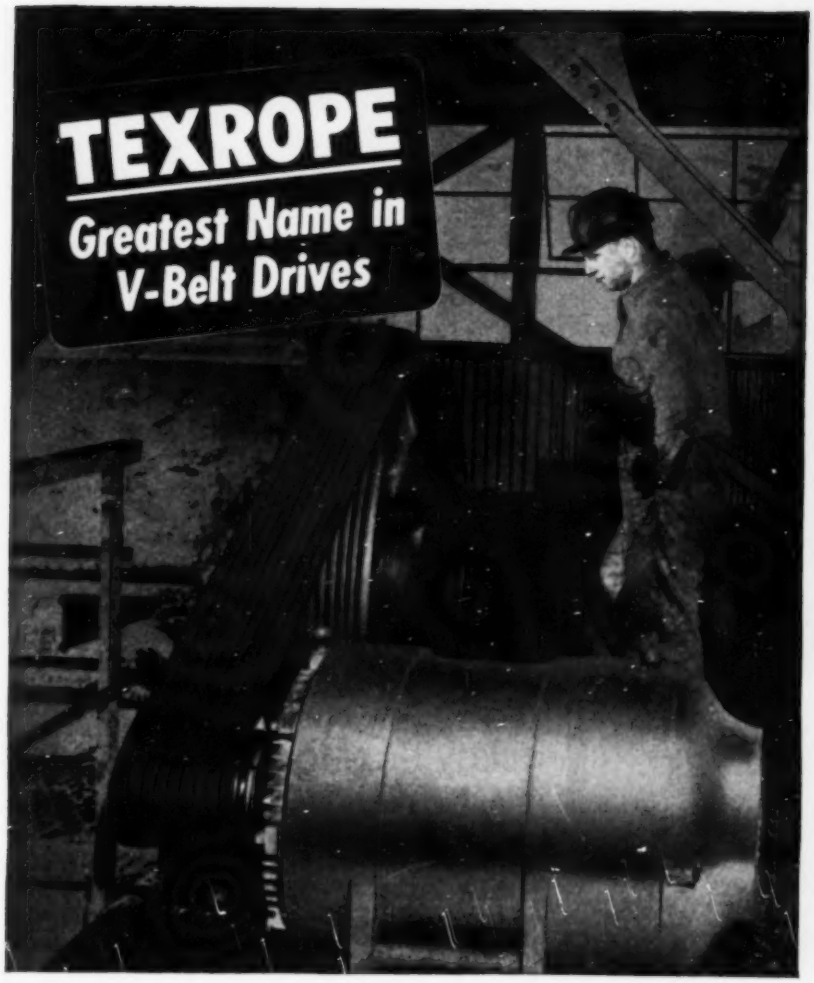

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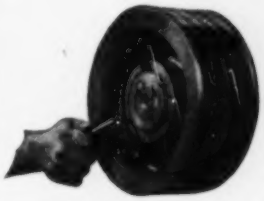

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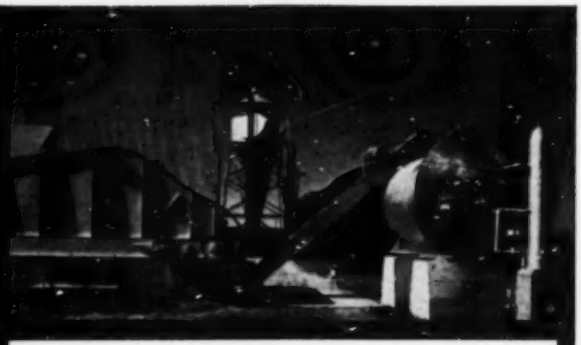

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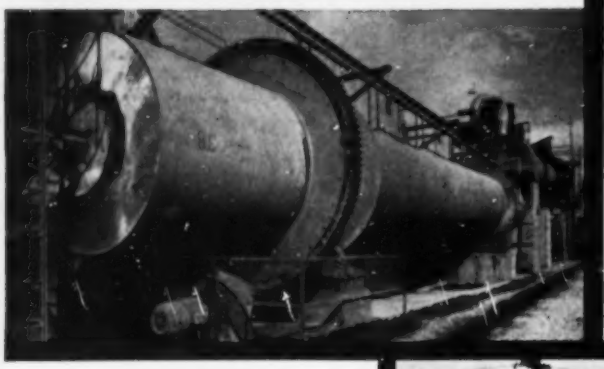

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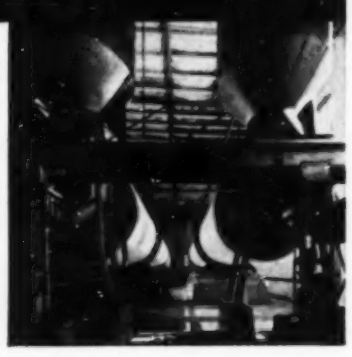
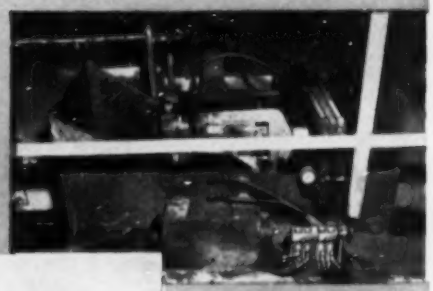


View of injectors connected to bearings on Belt Conveyor Take-Up Idlers.



View of injectors connected by flexible hose to bearings on Raw Coal Shaker.

One of three central lubricant Pumping Stations, showing dual power-operated pumps, time controls and pressure recorder.

Hanna Coal Co.

(Division of Pittburgh Consolidation Coal Co.)

Saves $32,240 a year in Labor alone with Lincoln CENTRALIZED LUBRICATION SYSTEMS at their New Georgetown Preparation Plant

WAYNE S. FUHR
Lubrication Engineer
Hanna Coal Company, Div.,
Pittsburgh Consolidation Coal Co.

"We first installed the Lincoln CentrOmatic* System in the original dry Preparation Plant in January, 1948. Bearing failures have been almost completely eliminated, and the saving, based on previous costs, is estimated at $20,000 per year. In the new 5 million dollar Preparation Plant our maintenance records indicate *a saving of $32,240 per year in labor alone. We have also saved approximately 45% in lubricant costs and have not had a single bearing failure since the System was installed.*

"When construction of our new Preparation Plant was begun in 1949, provision was made for equipping all possible machinery with Lincoln Centralized Lubrication. As a result, most of the 18,000 feet of lubrication line is concealed beneath the floors.

"The three central lubricant pumping and control stations serve (1) the Rotary Dump and Car Haul; (2) machinery on the upper floor of the Plant, including raw coal and refuse handling sections, washers, cones, picking tables, and all subsidiary conveyors; and (3) machinery on lower floor, including all drying and loading equipment, as well as equipment in the table section. To even approximate the results obtained from the Lincoln System, four additional lubrication men would be required, and still the thousands of dollars saved in lubricating materials, production time, and maintenance cost would not have been effected."

Hanna Coal Company
Wayne S. Fuhr, Lubrication Engineer

WRITE FOR A COPY OF BULLETIN DESCRIBING HANNA COAL COMPANY'S 7-POINT LUBRICATION PROGRAM

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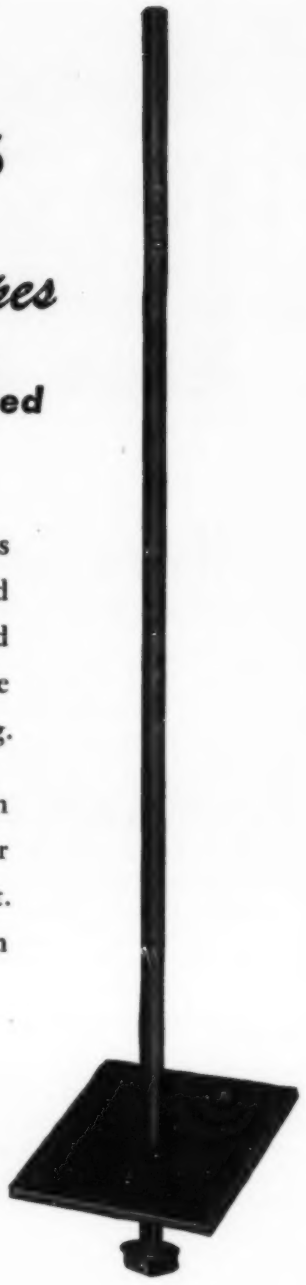

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Homocord Conveyor Belt—More use per dollar

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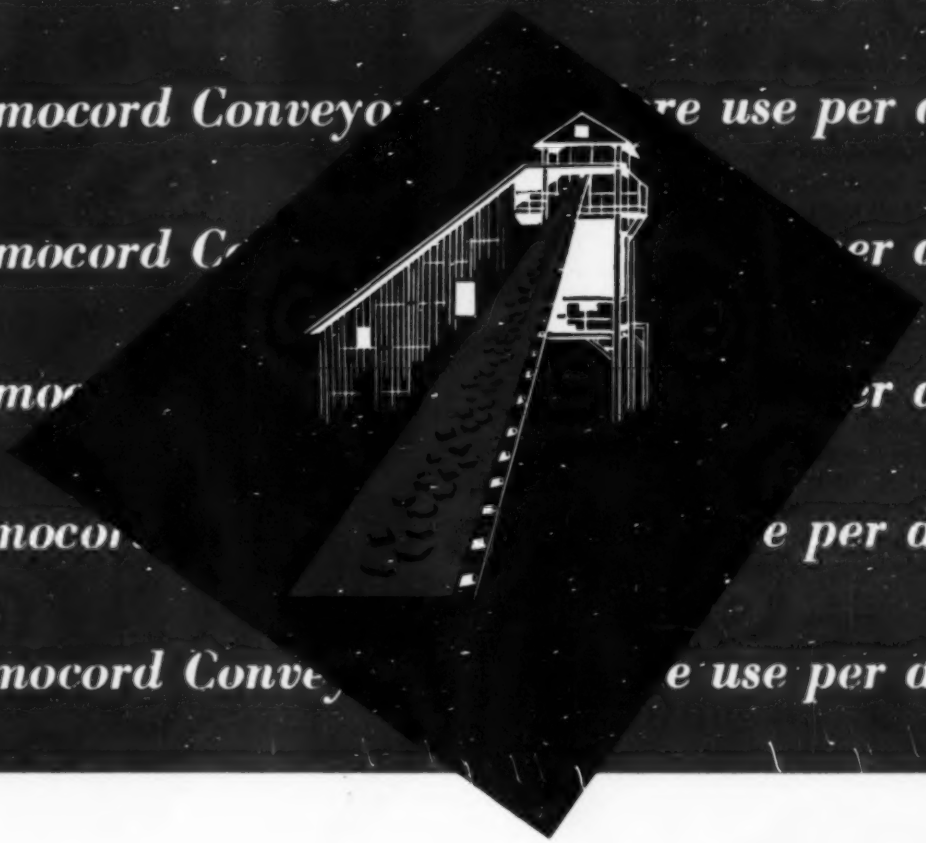

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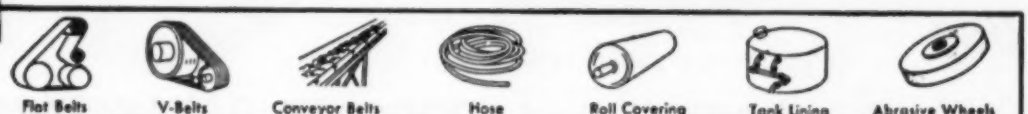

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Here **Plastic Reinforced Primacord** is used for the branch line, and **Plain Primacord** for the trunk line. Note the double half hitch around the plastic cover. It pulls up tight and stays that way.

Other brands to serve your needs are: **Reinforced Primacord,** for deep holes and resistance to abrasion; and **Wire Countered Primacord,** for deep, ragged holes.

P-3

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Coal Age

SEPTEMBER, 1953 IVAN A. GIVEN, EDITOR

Lift for Coal

HELP TODAY from where help can really come can give coal one of its biggest lifts in history—a lift that will assure the realization of its bright future. There is good evidence not only that "bright" is the word for the future, but also that movement into already has begun. This statement is made in sober realization of the fact that today things could be better, particularly in the commercial segment of the industry and more particularly in certain areas. On the other hand, the bituminous industry has been steadily shaving down its production deficit from last year—from nearly 40% at the start of 1953 to 3.9% Aug. 1. In short, there has been a definite reversal that looms up even more significantly in view of the added 1953 handicaps of further declines in railroad, overseas and other demands, and continued heavy pressure from competition.

How fast coal can pick up and how far it can go are, of course, dependent upon many factors, some within the direct control of the operators and some not. Right now, the No. 1 need is a moratorium on forced cost increases growing out of wage hikes that have kept well ahead of the industry's ability to offset them through more machinery and better mining. The adverse reaction has been intensified by the work stoppages and interruptions in fuel supplies that have marked the wage-raising process. Here is where help can be really effective—and Mr. Lewis is the one man who can do the most to make it available.

There is not too great a question but what coal as an industry can surmount the difficulties past labor increases have imposed upon it. But the law of diminishing returns is inexorable. When the price of anything is forced up too high for the value the user receives, he quits buying. Good value at a reasonable price is the real goal. It makes for progress by creating a climate that fosters sales, increases working time for employees, and permits continued investment in improvements with a fair return to the owners.

All these things are in the cards for coal today, IF it can concentrate its efforts on improving its position rather than devoting all its energies to merely holding its own against a succession of wage increases. Coal can—and will—expand its cost-cutting, quality, research and sales efforts—if it has a reasonable opportunity to do so. In this, Mr. Lewis can make a major contribution, as pointed out in more detail on the next two pages of this issue. He can really help not only the industry but his members as well.

Building on Benefits

ANTHRACITE still plays an important role in the economy of the area it can reach—one of the most highly populated and industrialized of the Nation—and can play an even-more-important one if its merits are properly presented. That is the basic approach to the industry's advertising, public-relations and merchandising programs, the latest of which is the organization of the Anthracite Industry Committee. The committee's goal is bringing the efforts of both the retail and producing branches to bear more fully on the problem of stimulating demand by bringing home to users and potential users the benefits of anthracite.

The keys will be improved service to users and broader distribution of modern automatic equipment and other developments that have improved anthracite's convenience, economy and efficiency, in line with consumer-survey findings that lack of progress reflects consumer lack of knowledge of these developments. As noted elsewhere on this page, coal has shown that it is willing to exert itself to improve its position and the positions of its employees and owners. This is one more piece of evidence that it should have a real chance at making such efforts pay off.

Your Opportunity, Mr. Lewis

Coal Age A McGRAW-HILL PUBLICATION • 330 WEST 42nd STREET, NEW YORK 36, N. Y.

August 27, 1953

Mr. John L. Lewis, President
United Mine Workers of America
Washington, D. C.

Dear Mr. Lewis:

If not now, you soon will have an opportunity to make a truly significant contribution to progress in the coal-mining industry, with a better living for your union members.

Today, coal stands on the threshhold of a future shaped by growing demands from the electric-power, steel and chemical industries, by the need for synthetic liquid fuels to supplement petroleum supplies, and by a growing population with increasing needs for goods and services.

The improving outlook for production and consumption, along with recent reports of better working time, indicates once again that coal can move across that threshhold—maybe not this year, maybe not next year, but relatively soon—IF no roadblocks are thrown in its path; if coal is not forced, by another increase in costs, to devote all its energies merely to holding its own.

What coal needs today is to strengthen its position in the marketplace by lower prices, higher quality and better service. These will grow out of further improvements the industry can make in mining, preparation, research and sales. The key is, of course, funds to carry on the work. These must come from profits, which in turn are a reflection of both volume and margin over cost.

Now, with the wage agreement subject to reopening, if it hasn't already been reopened by the time this reaches your desk, what's needed by everybody—operators, your miners, the union, the welfare fund and coal's customers—is not another increase in wages and welfare royalties. What's needed is a respite—a chance for operators to catch up with your miners' wage gains, which have outrun productivity increases; with developments in the fuels market; with research; and with their needs for new machinery and equipment.

HOW THE UPTURN LOOKS

Take a look, Mr. Lewis, at the elements that show the beginning of coal's upturn—an upturn that can be strengthened by realistic action on costs.

1. More production—By slow but steady degrees, bituminous has whittled down the deficit with which it started the year. At the end of January, production was running nearly 25% below January, 1952. But by Aug. 1, production for the year was only 3.9% behind the same period in 1952.

It's possible, Mr. Lewis, for this momentum to carry on through the remainder of the year. If it does, the industry will wind up 1953 with a better record than in 1952. But a hike in costs now can only make it harder to move ahead.

2. Improving markets—Bright spots in today's picture are the electric utilities and steel. In each of the first 5 mo of this year, the utilities burned more bituminous than in the corresponding month of 1952. At the end of the first 5 mo of 1953, their total burn was 45,081,000 tons against 41,989,000 in the same period, 1952.

Much the same is true in steel. In the first 5 mo of this year, steel and rolling mills and coke ovens used 50,424,000 tons of bituminous against 48,739,000 tons in the same period of 1952, before the steel strike began to cut into coal consumption.

Both industries, utilities and steel, are growing. Given a chance—that is, if coal can hold the price line, especially in serving the utilities—those industries in time will offset coal's losses in the railroad and home-fuel markets. In fact, the increasing use of coal by steel and the utilities already has offset nearly 50,000,000 tons of the total lost in other markets since 1946.

But to repeat, with the utilities coal must lay it on the line pricewise. Modern plants can switch from coal to oil and back again in a matter of minutes. Price determines whether it'll be coal or oil, Mr. Lewis.

The stirrings of an upturn now are visible in another segment of coal's markets—the "Other Industrials" group, which includes food plants and textile mills, Classes II and III railroads and a host of miscellaneous industries that burn a great deal of coal in the aggregate. An upturn in the coal burn by this group appeared in March, April and May of this year, with the result that at the end of the first 5 mo of 1953, the total burn was

43,051,000 tons against 42,655,000 tons in the same period a year ago. That's not a great difference, Mr. Lewis. But it is a difference, and one that's well worth cultivating. To grow, the trend that's now shaping up needs time—and peace.

3. Higher productivity—Tons per man-day is moving upward, Mr. Lewis. Latest figure from the Bureau of Mines is 7.36 as of about mid-year. In 1952, it was about 7.25 tons per man-day against 6.3 in 1946—a gain of some 15%.

But the gains in productivity have by no means kept up with gains in miners' wage rates. The result is that, instead of going down, direct labor costs per ton have moved up. In 1946, labor cost—wages alone—ran about $1.77 per ton. That was 51.7% of the average mine price of coal—$3.44. In 1952, labor cost per ton, counting in the welfare levy of 40c, was $2.89, or 59.2% of the mine price of $4.88.

In short, Mr. Lewis, the industry needs time for productivity to catch up with labor costs. That way, coal can encourage its expanding markets, find the profits needed to buy new machines, and raise efficiency still higher, thus insuring steady working time for your miners.

4. Better working time—Since mid-July, reports from the field indicate substantial improvements in working time.

These reports are straws in the wind, Mr. Lewis, but they bear the promise of more working days in the months ahead and, therefore, better weekly earnings for your miners.

The law of diminishing returns is the crux of the situation. When the price of anything, coal included, is forced up too high, the users quit buying or turn to cheaper substitutes. Another wage increase at this time cannot help your miners. Thanks to your efforts they have a good daily wage rate now. What they need to improve their earnings is more working time. That can be provided only by a respite from wage pressures, thus enabling the industry to get its costs down and win more customers for coal.

5. Declining oil imports—Since the earlier part of the year, the flood of imported residual fuel oil has subsided somewhat. In the 4 wk ended Jan. 24, daily imports of residual averaged 518,100 bbl. Since then, imports have dropped to an average of 272,800 bbl per day in the 4 wk ended Aug. 1. Much of this decline is seasonal, of course. But if coal prices are jacked up by another forced wage increase, the oil tide will be encouraged to sweep in again.

Backed up by your union and other interests, Mr. Lewis, coal operators this year asked Congress to stem the tide of foreign oil. Congress turned down that plea. But the battle isn't over yet. Coal men promise to carry the fight into Congress in January. They believe they have a chance to win their fight. But an increase in coal prices, forced by a wage boost, will make no friends for coal in Congress.

6. Markets for non-union coal—The steady increase in output by non-union mines shows one thing clearly, Mr. Lewis: An operator whose costs are realistic and whose price therefore is right can find strong markets for his coal. Non-union operators, uncommitted to the welfare royalty and free to agree on wage rates with their own men, are doing all right. Take two of the centers of non-union production, for example. In one, production in 1946 was 17,211,223 tons; in 1951, it had grown to 21,890,612 tons. And in another smaller but rapidly developing mining area, production grew from 740,016 tons in 1946 to 2,987,051 tons in 1951. In other words, Mr. Lewis, markets for coal do exist. What's needed is a price on coal that will enable coal to move freely into those markets.

WHAT'S UP AHEAD FOR COAL?

Put it all together, Mr. Lewis.

For bituminous coal, the signs of an upturn are pretty clear. As previously noted, they include a steady overtaking of the production deficit, some improvements in markets, gradual increases in productivity, better working time for miners, a temporary decline in oil imports, and ready markets found by coal that's priced realistically. Anthracite, as you know, has not fared as well but it, too, can do better with the necessary help in the cost department.

Now look a little bit ahead, Mr. Lewis. In a few years—by 1960, say—old reliable customers, the utilities and steel, will be using a great deal more coal—the utilities, well over 160,000,000 tons a year; steel, at least 10 to 20% above present levels.

Now look still further ahead, Mr. Lewis.

The energy curve is moving up. From 1946 to 1952, energy demand rose over 20%. That growth reflected increases in population, bigger demand for goods and services, and the increasing substitution of horsepower for muscle. Nothing in today's picture suggests that the energy curve will slope off. By 1960, energy demand doubtless will be some 20% above 1952.

Assume that coal merely holds its own in the energy market. By 1960, the Nation will need well over 625,000,000 tons.

But that's not all. Given a chance to make the gains it's entitled to, between now and 1960 coal easily could outstrip 625,000,000 tons. One aspect of that outlook recently was developed by Eugene Ayres, technical assistant to the executive vice president, Gulf Research & Development Co. In an article in *Coal Age*, August, 1953, Mr. Ayres predicted that the downturn in petroleum growth may become apparent by 1960. If that happens, coal—as a solid or perhaps even as a liquid—may have to supplant oil in some markets now served by liquid fuels.

Then there's the inviting new market for coal in the manufacture of organic chemicals, an industry that's now growing lustily. How much coal tonnage? Nobody knows. But it will be big in the years up ahead.

WHAT COAL NEEDS

But coal's bright future depends, Mr. Lewis, on the industry's ability to maintain a competitive position in today's market. In other words, forcing coal costs up now will dim coal's outlook and give aid and comfort to coal's competition.

That's why this year, 1953, is not the year to raise costs again. This year should inaugurate a breathing spell—a period in which coal can hold its present business and begin to build for its better future. Given the opportunity, coal men can do the job—and will do it—by putting machines they now own to better use and by buying new machines to push efficiency still higher.

But it will take more than the operators can do alone to put coal well on the road toward its better future. It will take the pooled good judgment of all who have a stake in the industry. Working together, operators and your union can create a climate in which coal sales will grow, employees will work more days and earn more money, and the industry can invest in improvements with the expectation of gains for all to share in.

So, Mr. Lewis, take stock of the facts. Balance today's needs against the promises of the future. Join your strength with that of the operators. That way, you can really help in building a solid foundation for growth and a better living for all who depend on coal.

COAL AGE SPECIAL REPORT

Cutting Cost in Stripping

Are you reaping the greatest benefits possible from your stripping equipment?

Are your men using their skills to best advantage?

Are management and workers pulling together as a team and are they enthusiastic about their jobs?

Is maintenance directed toward keeping machines producing at maximum capacity with minimum of down time?

Are you seeking improved equipment and new methods as aids to getting more production?

THESE ARE SOME of the questions that cost-conscious strip operators constantly are asking themselves as they check the cost sheet. The answer to these and many others must be "Yes" if stripping costs are to be reduced. In some cases, everything possible has been done and consequently a nice profit is being realized. In others, the record is not so good. The job is a matter of a will and a way. The will to cut costs must be ever present in all minds and it must never be left to falter or weaken. The way is a definite goal backed up by continuous, thorough study of methods and equipment. The profit-yielding operations of today prove that this approach pays off.

First Get the Facts

Meeting the challenge of cost cutting in a strip operation requires more careful analysis than in deep mining. Fewer men and machines are involved and, therefore, management must look at each machine and work cycle with a finer-toothed comb. On the surface the operation may look good and management may feel that the cost is as low as possible. However, present market conditions do not warrant a complacent attitude and therefore progressive operators are continually improving performance by upgrading output of present equipment or by adding new or auxiliary units to increase tons per man shift.

Cost-cutting rests on facts. Therefore, before embarking on a cost-cutting program, all the facts about the operation should be put on paper. If there are accurate production, engineering and accounting records, this will be relatively simple and will require only getting the record before you in condensed form. If the records are not too good, then it is necessary to set up a system so that everyone on the management team will know where the operation stands from day to day.

The logical place to begin is with equipment. First, list each piece of equipment by make and type. Then put down the following information about each unit: model, rated work capacity, cash value, depreciation rate, maintenance cost in cents per ton, where the equipment is used and its work schedule. A careful examination of this information will show if there are glaring inequalities in costs or method of use. There may be a real opportunity for savings in maintenance costs by trading in old high-cost units and replacing them with new higher-powered improved-design units. For example, it may be desirable to trade in all of your bulldozers for new models rather than spend a great deal of money rebuilding the old models. Even though a piece of equipment is not fully depreciated it may be better to replace it with a new unit and reap the benefits of lower maintenance and greater output the newer model can provide.

Next, you will want to have a look at your mining plans and coal re-

1. Overburden Preparation: Among many approaches to lower handling costs is sequence shooting. In Indiana it saved explosives and provided better fragmentation and reduced vibrations (CA—June, 1951, p 86).

2. Proper Equipment: Matched capacity for all units aids production. Smooth operation of 70-ton truck is achieved with torque converter and power steering at low cost per ton-mile (CA—April, 1951, p 84).

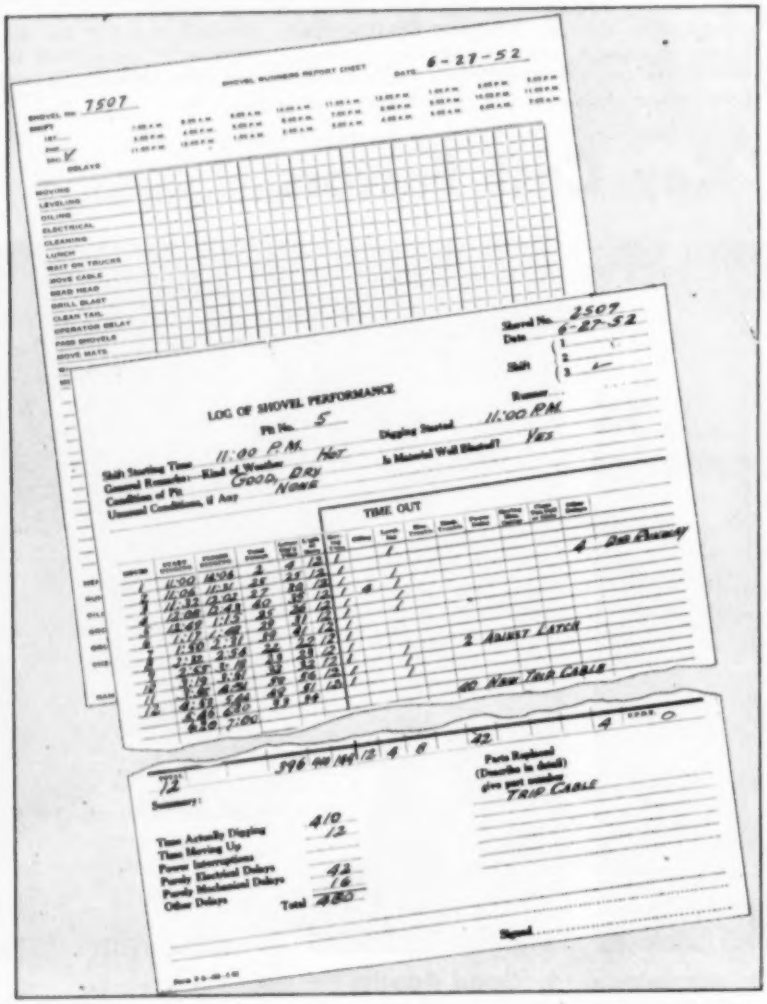
Four Key Cost Factors

3. Effective Maintenance: Good maintenance practice will reduce down time. Power tools cut repair time on stripping units by removing rusted or dirt-encrusted nuts or studs quickly (CA—June, 1952, p 118).

4. Good Roads: For long hauls and where spoil must be hauled, good roads reduce haulage costs. Planned roads with maximum grades less than 8% permit fast haulage by 30- and 34-ton trucks (CA—April, 1952, p 82).

AERIAL MAPPING promotes stripping efficiency by furnishing engineers and operators cheap accurate maps for planning (CA—Oct., 1950, p 75).

Start With Facts . . .



SHOVEL STUDIES, including swinggram and shovel operator's report help engineers and maintenance supervisors spot weaknesses (CA—Nov., 1952, p 84).

serves. The quantity of coal you have available for future mining will play a large part in any decisions you may have to make regarding equipment changes and mining methods. The easiest way to do this is to have a set of good maps showing the property outline with strip areas clearly indicated. If more than one area is available for strip mining, each should be clearly shown with following information: tons of coal, thickness of coal, proposed highwall, ratio of overburden to coal, equipment to be used in mining, life of the strip area and rate of extraction.

A useful supplement to the reserve map is a progress map showing the theoretical progress with the equipment setup and against it the actual progress. This will permit you to see at a glance whether your equipment is performing at par. Any unusual variation from the rated output values should be cause for prompt investigation.

These two maps will help you with the long-range planning that is fundamental to keeping cost down. A great deal of money can be spent on useless roadbuilding, power-line construction and the like if planning is poor or uncoordinated.

Aerial surveying is a valuable tool that may be used to obtain accurate topographic maps quickly and cheaply. Photo mosaics of a large area can be made at a very low cost and will save time in selecting areas to be developed. For development planning, aerial topographic maps are of great help in estimating coal acreages, plotting boreholes, computing overburden, estimating spoil areas, selecting and building haulage roads, planning equipment moves and pit drainage, and laying out future underground workings.

The time required for aerial mapping is less than half the conventional-method time. Savings in dollars are even more significant when compared to conventional ground methods.

Thorough, systematic sampling by core drilling well ahead of mining operations will permit plotting of coal thicknesses and analyses on work maps. In some types of stripping, a good analysis and thickness map can save money by steering operations to areas where mining conditions and coal quality are favorable. Core drilling also yields valuable information about the type of rocks in the overburden and reveals any unusual changes in position of the coal. Knowing exactly the type, thickness and volume of overburden will go a long way toward keeping drilling and shooting costs as low as possible.

Know What You're Doing

Along with the maps, it is wise to have an outline of the stripping cycle either mentally or, better still, written, to analyze the entire operation. This will show you where each piece of machinery fits into the picture, what each is expected to do and how it is to do it. A written outline also will serve as a record to keep the operation on the beam in the future.

To complete the picture in getting the facts about your cost, you will want a complete performance record for each piece of equipment. This will show you whether the unit is operating at capacity and will pinpoint any subpar performance. It is wise to keep figures for each shift so that you will know what each is doing and will be able to pull up the slack whenever necessary. You can also use these figures to create competition between the various shifts.

One large producer keeps daily equipment-performance reports containing accurate information on work performed and amount and type of delays on each piece of equipment. These, in effect, are daily time studies taken by equipment operators, and supply management with important information about equipment performance. Weaknesses in machine design, maintenance or operation procedures are readily detected from these reports and corrective measures are taken as quickly as possible.

Competition between shifts is stimulated by furnishing all machine operators with a complete daily record of all similar units. Operators keep these posted in their cabs for ready reference.

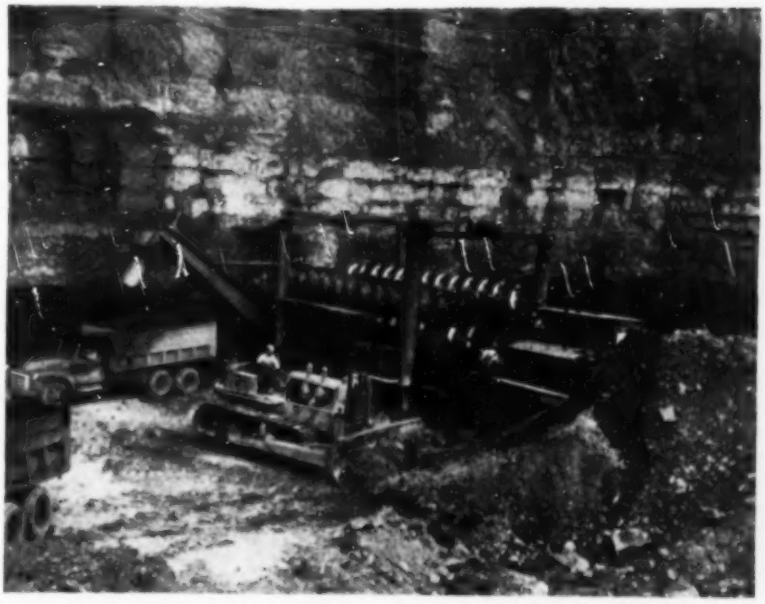
What New Methods Offer

By careful examination of the records and maps you will be able to see if your operation has the balance necessary to get the most out of equipment and manpower. For example, it is of no help to have a large high-capacity coal-loading shovel available unless it is kept busy loading throughout the shift.

Many recent developments in new equipment present new opportunities for smoothing out an unbalanced operation and cutting cost. To take full advantage of them you will want to examine your operation to see how they can be fitted into your mining plans. One example is possible addition of a highwall coal-recovery auger to mine coal up to 210 ft beyond the highwall. In favorable conditions one of these units is currently producing an average of 560 tons per shift.

EFFICIENT handling of 30 to 35 ft of overburden as the first step in stripping to a 75-ft highwall is achieved with tractors and pans (CA—Aug., 1953, p 74).

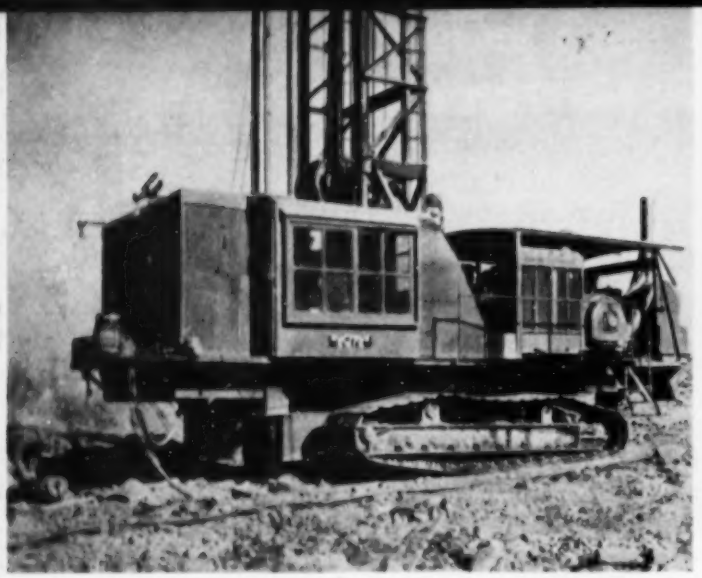
Pick Units for the Job



HIGH-CAPACITY AUGER adds 700 tpd to strip output in West Virginia while recovering coal up to 210 ft beyond the highwall (CA—Aug., 1953, p 74).

Some companies have used augering to recover coal left in small hilltop islands and which could not be mined at a profit in any other way. Others have reduced their overburden ratio and hence their production cost by working to a lower highwall and using the auger to recover coal to and beyond the former limits. The result has been a double-barrel reduction in cost—a reduction in strip-mine production cost plus production of lower-cost auger coal.

Another example of cost-cutting achieved by applying new methods is application of the new-type rotary vertical drills for boring blastholes. These new drills, replacing churn drills, permit faster overburden drilling, provide cleaner holes and excellent stemming material, while making possible an appreciable saving in quantity of explosives required per cubic yard of material shot. One such unit has drilled enough overburden in one month to permit a large dragline to move 1,023,000 cu yd of overburden in 26 24-hr work-



FASTER OVERBURDEN DRILL reduces drilling manpower by 79% while putting down 2,000 ft of 10⅝-in hole in two 7¼-hr shifts (CA—Mar., 1953, p 80).

RADIO RAISES STRIPPING EFFICIENCY for an Indiana operator by reducing equipment downtime and improving supervisory efficiency (CA—Feb., 1950, p 102).

Adapt New Equipment and Ideas

ing days. Savings in manpower up to 79% are achieved with this rotary drill over the churn drill.

To take advantage of savings possible from installation of new-type equipment, you will want to check your equipment performance to see how any new equipment will fit into the picture. Investigation may indicate that even greater savings can be achieved not only by adding new-type equipment but also by purchasing auxiliary machines to work with existing units. For example, purchase of a bulldozer or scraper unit to work in the spoil area with a stripping unit may eliminate double casting or permit the stripping unit to work to a higher bank with the same efficiency as on a lower highwall.

Planning More Yardage

If equipment isn't performing at par and you can't put your finger on the trouble, then take each step of the production cycle and study it carefully.

Effective use of modern drilling equipment requires sound fundamental planning plus daily observation of results. No over-all performance standards can be set to cover all types of overburden. Therefore, each mining operation must seek its own standard.

The goal in all overburden preparation should be to get the maximum quantity of breakage per foot of hole drilled and per pound of explosives. To arrive at the best practice for any strip operation, you must consider such factors as type of overburden drill available, the size of hole it can drill and how fast it can drill the hole. The size of hole plays an important part in the choice of the type of explosive, and, therefore, in the quantity of overburden that can be shot per pound.

Furthermore, the size of blasthole is tied into hole spacing since a smaller-diameter hole cannot hold as great a volume of explosives as a larger one. The new-type drills have not only made it possible to drill holes up to 12 in in diameter but at a much faster rate than old-type drills. One new drill has bored 2,000 ft of 10⅝-in hole in two 7¼-hr shifts.

Better Blasting Results

The best method of blasting must be carefully developed at each operation. No matter how sound in theory certain methods may be, the material blasted and the conditions under which it is shot vary greatly and present so many chances for error that practical knowledge gained daily must be the guiding factor. Careful records should be kept for all blasts. These should include depth of holes, quantity and distribution of explosives per hole, type of overburden, and yardage drilled and blasted each day. It must be remembered that any given explosive can do only so much work. If it is given a bigger job, it will not give satisfactory results. By constant vigilance, the most economical method for blasting can be achieved for any operation.

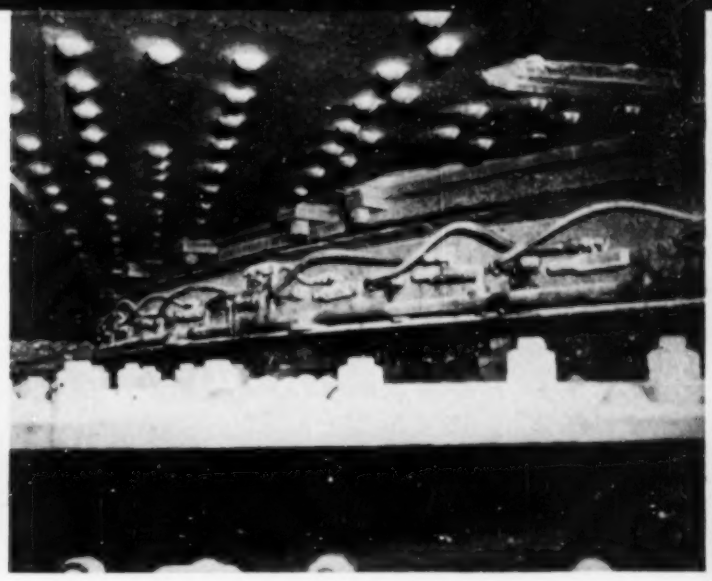
The advantages of sequence shooting should not be overlooked in getting the most out of explosives. Many operators have used millisecond delays and delay blasting caps successfully to get better rock fragmentation with less explosive. Good fragmentation makes digging easier and permits the stripping unit to uncover more coal per shift. An indirect benefit from sequence shooting is less wear and tear on the stripping unit when it is working in well-shot material. Hence, maintenance is lower and productive time is greater.

Capacity Stripping

Closely linked to overburden preparation is the output of machinery assigned to removal of the cover. Basically, the objective is to have the shovel or dragline remove as much of the shot material as possible each shift. This means determining the economic limit between spending more money for explosives and getting better fragmentation, with resultant greater output for the stripping unit, or spending less for breakage and moving less cover per shift. Many times, spending more money for explosives will be offset by increased output of the overburden unit, with resulting increased output for the coal-loading units. A careful analysis at each operation will indicate which will produce coal at the lower cost.

After you are satisfied with your overburden preparation, the next opportunity for cost cutting lies in proper handling of the shot material—

REDUCTION in haulage cost up to 35% were achieved by eliminating 1,950-lb deadweight from semi-trailer units at a Pennsylvania mine (CA—May, 1949, p 102).



SAVING $75,000 a year in maintenance of stripping equipment is attained by advanced lubrication methods at an Ohio operation (CA—Jan., 1952, p 76).

to Your Mining Conditions

having the right equipment for the job and using it effectively. Basically, the greatest opportunity lies in reducing labor cost per ton of coal and this is dependent upon how much each man can produce with the equipment on the job. It costs just as much per hour for one man to operate a 10-yd dragline as to operate a 25- or 30-yd unit. Therefore, it is desirable, where practicable, to use as large a stripping unit as possible. Of course, having the large-capacity unit is not the only requirement—the machine must be used at top efficiency. The following are industry-proved methods for keeping machines performing at top capacity:

1. Use of swing recorders to indicate work time during the shift.

2. Use of load indicators located in operator's cabs to show when the shovel or bucket is fully loaded. This assures a full payload for each pass of the stripping unit, minimum amount of loading time.

3. Proper spoiling of overburden so that the time required to get a loaded bucket, spoil it and return for another is a minimum. Fast bucket loading is achieved by a good machine operator having a well-prepared bank to work in—the finer the material, the easier it is to load. Each operator, as previously noted, will have to decide for himself the economic limit on spending more money for explosives to get better fragmentation. Minimum swing time is achieved by planning the spoil area so that the shovel or dragline will move through the smallest possible arc of travel when moving from overburden to spoil area.

4. Proper operation of the strip unit is often overlooked in seeking ways to up production. For example, how many operators analyze the work of a shovel or dragline to see if the machine operator is handling the unit in a manner to get the best digging efficiency with the minimum power consumption?

In dragline work, the greatest opportunity for achieving maximum work with minimum power consumption and wear and tear on equipment lies in proper working of the digging face. Working across the face in horizontal layers will give better production than working in deep trenches. The loaded bucket should be lifted as nearly vertical as possible to keep power consumption and demand as low as possible. Poor operators may consume up to 42% more power if they try to dig on a slope near the machine and lift the loaded material approximately 45 deg with the vertical.

Side pulling with the boom overheats and wears the swing clutches and puts unnecessary wear on the flanges of the boom-point sheave. This practice should be avoided.

It is obvious that quick loading and immediate hoisting—as near vertical as possible—will produce the most yardage. Keeping the digging area under the boom will pay dividends in extra yardage. The bucket should be filled in a traverse of two to three bucket lengths, and when full should be hoisted immediately. In most instances it is best to lift and swing the bucket even though not completely full after two or three lengths of travel. Frequent moves of the machine to maintain a favorable digging zone will pay off.

Bucket-maintenance costs can be kept at a minimum by careful handling. Several practices to avoid are: dropping onto the solid, including particularly dropping with teeth down; casting and jerking the bucket in the air; and striking the bucket against solid objects to loosen sticking material.

Sharp bucket teeth are necessary for good digging. Spare sets should be on hand for frequent changing to permit build-up with hardface welding in small amounts, rather than waiting for teeth to become badly worn.

Prompt attention to cracks in the bucket caused by accidental abuse will keep maintenance cost down. If digging is tough, it is wise to have two buckets per dragline so that bucket maintenance can be done during regular work hours and without delaying dragline output. Two buckets bought at the same time and kept in good repair will normally last longer than buckets bought one at a time and used until worn out. The elimination of overtime pay for off-shift repair will pay a large part of the cost of a spare bucket.

Proper adjustment and adequate lubrication go a long way toward good performance and low maintenance cost for shovels. If clutches are not properly adjusted, hoist-cable life will be shorter, shafts, chains and

dipper stick will be subjected to damage. Digging hard material with the dipper at maximum height causes heavy loads on the teeth and dipper, dipper stick and boom. Improper clutch adjustment and misuse will increase maintenance costs and be reflected in higher coal-production cost.

Better Coal Loading

To get maximum output from the coal-loading unit, the cost-conscious operator should check the following procedures:

1. Plan shovel and truck locations so that shovel swing will be a minimum.
2. Make frequent short moveups to prevent the shovel from reaching for material.
3. Be sure that crowding by the shovel operator is kept to a minimum.
4. Load trucks on both sides of the shovel if possible.
5. Refuel and grease during the lunch hour or after the end of the shift.
6. Set up a continuous careful inspection system to prevent breakdowns.
7. Keep dipper teeth sharp.
8. Keep a supply of fast-moving parts like wire rope and dipper teeth close on hand for quick replacement.

Save With Planned Preventive Maintenance

A well-planned preventive maintenance program cannot be overlooked in cost cutting. It is well to check maintenance carefully to see where it can be improved either in methods or personnel. Shovel or dragline downtime can be decreased by efficient teamwork in the field. Every effort should be made by crews to reduce the time required to change buckets or dippers, ropes, crawler pads and the like, particularly when equipment is used round the clock. Every minute saved in changing a part is one more available for production.

Systematic inspection of all stripping equipment will aid greatly in spotting weaknesses in machinery or points where immediate attention will save a major breakdown. The man assigned to this work should be skilled in strip-mining methods and especially in maintenance. He should be able to make on-the-spot decisions at breakdowns to decide if it will be cheaper to fix the machine in the field or replace the broken part with a spare unit and do the repair work in the shop. Often a spare unit assembly can be installed in a matter of an hour or so while repair of the unit in the field would take two or three times as long.

REPOWERED TRUCKS increased production by permitting faster speeds over longer hauls. Old engines serve as spares for use when in-service units need rebuild or major repairs (CA—Oct., 1952, p 88).

. . . Improve Equipment

Centralized lubrication of strip shovels and draglines can add as much as an hour to daily production time in addition to providing positive measured quantities of grease to all moving parts. Conventional lubricating methods normally require that the machine be stopped while equipment receives a one-shot application. With hand methods, lubricants were wasted by trial shots and by throwing away contaminated grease. Benefits increase in direct proportion to the size and complexity of the machine. There is a significant saving in quantity of grease used because only enough to do the job is applied by the automatic system.

No system of maintenance is better than the men doing the work or the shop facilities available for doing the work. If maintenance men do not have the skill to turn out quality work in reasonable time, corrective steps should be taken. Schools or night classes can be established by the company to improve the skill of promising maintenance men. Another way to upgrade maintenance men is to send them to factory schools where experts often serve as instructors. The money spent on improving employee skill will be returned many times in faster, better maintenance work.

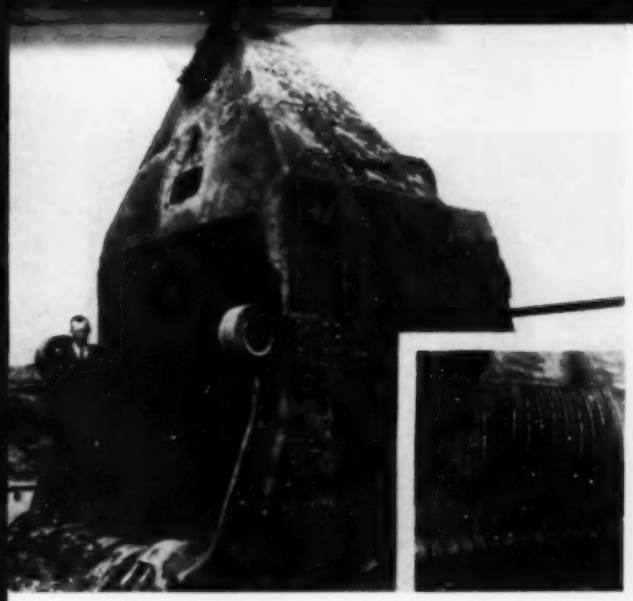
If skilled mechanics are available, they should have good materials and tools to do a good job. A well-lighted, heated shop will keep the workers' morale high and will permit them to work at top efficiency regardless of weather conditions. Ample floor space should be provided to permit rebuilding of trucks, bulldozers and other large equipment. There is nothing more discouraging to a good mechanic than lack of work space.

Special trucks for servicing units in the field can increase operating time by permitting maintenance crews to repair equipment in less time. Included in these are portable cranes for removing heavy parts, high-capacity welders, tool trucks with all the tools necessary for field maintenance, and lubrication and fuel units capable of supplying clean products at high speed.

Power For Production

Opportunities for savings with an efficient electrical installation should be carefully investigated. The relatively short time spent in measuring the voltage at a drill or shovel may point out the need for changing the power distribution system so that equipment can operate at top capacity. Start at the power source and be sure that the incoming voltage to the mine is normal. Electric utility companies sometimes unknowingly deliver power at below normal rating. Consequently, strip equipment operates sluggishly and there is more than normal heating. While low voltage from the power supplier is relatively uncommon, it is wise to measure it periodically.

If incoming voltage is good, then



HARDSURFACING increases life of 35-yd dipper for a Midwestern operator. Parallel beads on underside protect the dipper against scouring action (CA—July, 1952, p 144).

FLUME AND TRESTLE solved a water-diversion problem at considerable savings by eliminating the expense of making a new stream channel (CA—Nov., 1949, p 102).

. . . Use Latest Materials

a systematic check at junction boxes and transformer stations will show where the trouble lies. Often the low voltage can be corrected by one move of a transformer station. In any event good voltage will make equipment last longer and will permit it to work faster.

One approach to getting better power is a flexible power distribution system. Units should be readily movable and rugged enough to withstand the handling given equipment around the mines. Access for maintenance should be easy, and parts should be easily replaced.

Facilities for good lighting of the strip area should be included in any power installation. Good lighting of the highwall near the stripping unit will permit the operator to use his machine much more efficiently than if he is working in semidarkness. Drill operators will be able to move and reset their drills faster if they are provided with ample lights. Proper lighting at the truck dump will speed unloading. It is natural for men to move slower when the light is bad, but management can help reduce the handicap by providing ample lighting.

Adequate protective devices should be installed in all power distribution systems to protect personnel and equipment. Poorly installed safety ground facilities can result in burns or death to employees or cause extensive damage to equipment. Good lightning protection will prevent costly damage during the summer electrical storms.

High-Capacity Haulage

Efficient haulage is a combination of modern equipment and modern roads. Some of the points to check are:

1. Size of truck in relation to size of coal-loading shovel dipper. Best results require a truck size around four to five times the dipper size. This permits the greatest output from the shovel and prevents spillage in the pit. Of course, this relationship is not true in all cases, but it is a good rule where end-dump trucks are used. For longer hauls, the larger bottom-dump trucks have the advantages of using less manpower and permitting more uninterrupted loading by the shovel.

2. A cleanup unit, such as a road grader, should be available for use with the shovel to keep the loading area smooth so that truck-spotting time will be a minimum.

3. One or more spare trucks should be available in case of a truck breakdown, so that the full capacity of the coal-loading shovel can be used.

4. Trucks should travel at the same speed to assure uniform full working time for the coal-loading unit.

5. Nature and condition of road beds should be checked regularly. A good dry-weather road can become a bottleneck if it turns into a slippery rutted road when it rains, and can result in increased haulage cost. For instance, the power required to haul on a soft, rutted dirt road may be up to 2½ times that required on a firm surface. This means more fuel, more wear and tear on the engine, and shorter life for steering mechanisms, gears and the like.

Grades should be avoided as far as possible to keep power requirements down. To illustrate, it takes twice as much force to move a 20-ton load up a 5% grade as on the level. Another point to consider is that more trucks and drivers will be needed where roads are not well built and large haulage units cannot be used. In addition, larger units carrying up to 80 tons, cannot operate on poor roads. Thus, more money must be spent to pay drivers and run smaller trucks.

Where grades are severe and hauls are long, many operators are saving on truck maintenance by equipping haulage units with torque converters. Performance is smooth and drivers cannot abuse the engines.

Special Materials and Tools Cut Daily Costs

Special high-strength lightweight alloys provide several new opportunities to reduce maintenance costs and increase production. Longer life for bucket teeth and buckets made from special alloys reduce maintenance labor per ton of material moved. Increased production in the form of more payload per pass is possible when the entire bucket is made from special lightweight alloys. For instance, if the weight of the bucket can be reduced by 1 ton, then the machine will be able to handle a larger quantity of overburden. Use of special alloys makes it possible for stripping

COST CUTTING TODAY . . .

SPECIAL-PURPOSE auxiliary vehicles promote full-time production of digging and hauling equipment and cut maintenance cost (CA—Dec., 1949, p 98).

EFFICIENT TIRE-REPAIR SERVICE and systematic inspection cut tire cost at a large Pennsylvania operation using 226 trucks and cars (CA—April, 1953, p 76).

Save With Special Tools . . . and Good Maintenance Facilities

SERVICE CENTER at a Missouri mine provides a smooth flow of material and parts to working areas as well as facilities for efficient maintenance of all stripping units (CA—Sept., 1949, p. 84).

units to handle as much as 25% more payload since a larger bucket made of alloy steel plus the added payload weighs no more than a standard-type bucket with less payload. This increased capacity is available at a relatively low capital expenditure.

Where conditions permit, many operators are relying on two-way radio for quick communication between scattered working areas, shops, preparation plant and office. This arrangement permits the supervisor to travel freely at all times and yet be available on short notice for on-the-spot supervision when needed. Downtime also is decreased by calling from the pit for parts or a mechanic when a breakdown occurs. A 15-min delay on a large shovel can cost several hundred dollars in lost production.

Another method of reducing downtime is to have portable pre-fabricated shop buildings set up at the strip site if frequent moves are necessary to mine comparatively isolated areas. A large building equipped with a high-capacity overhead crane, welding facilities, tire-mounting and vulcanizing equipment and various machine-shop tools is necessary for a large strip operation. Mobile welders and cranes are great aids in speeding field repairs.

Handle Water Cheaply

Savings from good handling of water are twofold. First, a minimum of labor and material will be required if water is handled efficiently. Sec-

ond, the performance of men and equipment will be better when water is diverted from work areas.

The cheapest way to handle water is to prevent inflow to the pits and roads. This can be done in several ways: (1) ditching above the highwall to divert surface runoff, (2) diverting streams to new channels to prevent seepage into the pit, and (3) building flumes where ditching is impractical.

When water enters the pit as the result of rain or seepage, the cheapest way to handle it is by gravity flow. One of the most economical ways of doing this is by preplanning spoil areas so that windows or drainways are left at strategic locations. Pipes or culverts may be used where it is not practical to leave open areas in the spoil bank.

Where pumping is required, considerable savings can be made in selecting the proper equipment. Wheel-mounted units capable of pumping in all positions are easily set up for operation and require less maintenance. Plastic hose and pipe have become popular because of resistance to rot, corrosion and abrasion. Aluminum pipe offers the advantage of easy handling. Threadless couplings speed installation of pipe lines and increase pipe life by permitting individual joints to be rotated 180 deg, which puts the unworn side on the bottom when leaks develop. Thus life is nearly doubled. Check valves in suction lines will permit faster dewatering by eliminating the need to prime pumps. Where corrosion and abrasion are problems, impellers and pump interiors will last longer if coated with rubber-base materials.

Good haulage-road drainage is equally important to efficient operation as good pit drainage. Careful attention to placement of drainpipes or culverts will pay off in faster haulage and will reduce road maintenance. Truck maintenance will be lower when they do not operate on rutted or muddy roads.

Save With Safety

Safety and cost cutting go hand in hand. An effective accident-prevention program carried on with co-operation of management and labor will result in a decrease in lost-time accidents, better employee relations and a reduction in compensation-insurance cost. To get results in a safety program, it is necessary to get the co-operation of all employees. One method used successfully by a Kansas operator is to give every employee a personal responsibility in administering the program. This was done by giving each a chance to serve on committees responsible for the safety in various divisions, such as, drilling, hauling, blasting and the like. The duties of committeemen in the various divisions are to make regular inspections; be alert for hazards; report to management all unsafe working conditions; caution all men doing work in an unsafe manner; investigate accidents; and attend regular monthly meetings.

Monthly meetings between management and the division committees provide a clearing house for discussing safety problems and presenting recommendations. Any suggestion approved at the meeting is followed up by the safety director to see that it is carried out. As a result of the program, hazards have been decreased and employee morale is high.

It is difficult to measure in dollars and cents all the savings resulting from an effective safety program. Direct evidence appears in reduced compensation costs because of reduced accident frequency and severity rates. A very important indirect benefit is that production increases when severity and frequency rates decrease.

Making and keeping all employees safety conscious should be the keynote of any safety program. Maintaining continued interest in the program through meetings, contests, first-aid and accident-prevention courses, follow-through on safety suggestions and elimination of work hazards will go a long way toward helping a company achieve a better safety record.

Develop Personnel

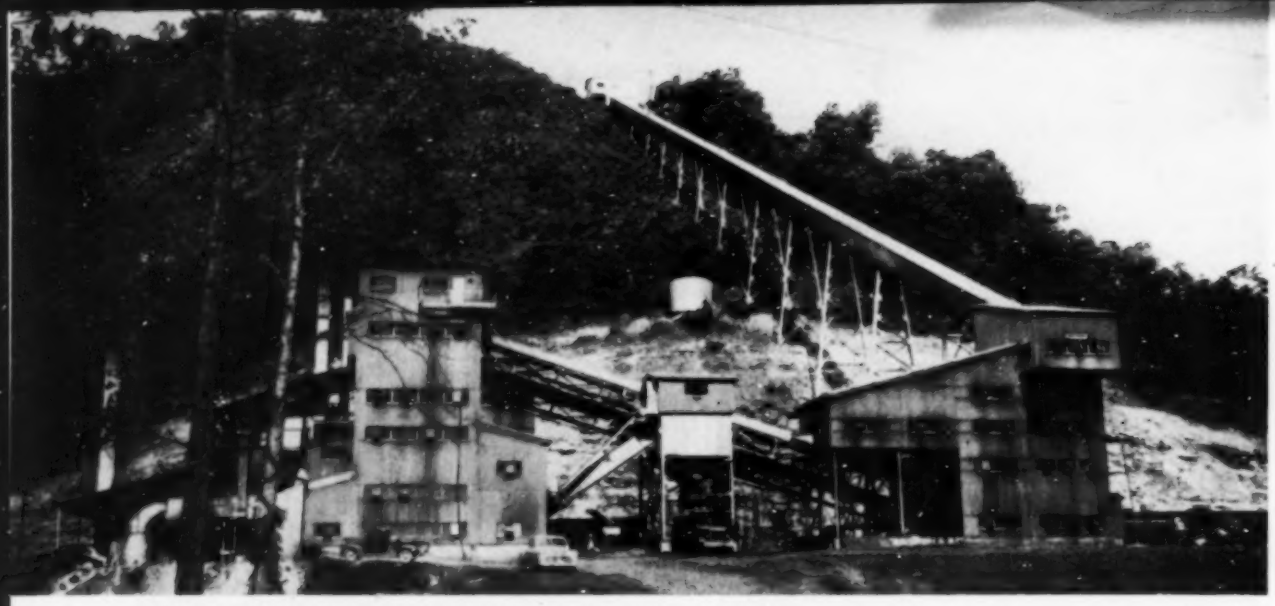
Skilled workers who take pride in their jobs and perform them with enthusiasm are the most valuable assets a mining company can have. To keep costs as low as possible, good supervisors should be available to lead men in their daily tasks. Adequate skilled engineering talent should be included on the staff and young promising engineers should be in training for placement in responsible positions in the future. As equipment becomes increasingly complex and methods approach a factory assembly line, the need for technically trained men will grow.

Definite steps should be taken to upgrade worker skill wherever possible. Results from better trained workers will be more efficient operation of equipment, better maintenance with less downtime, and better co-operation between workers and management.

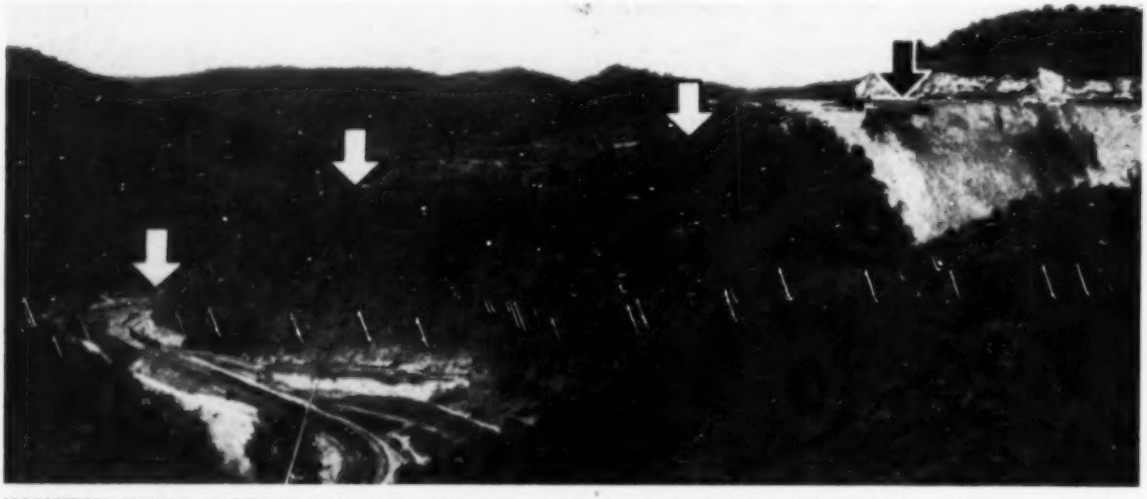
Cost-Cutting Checklist

Where to look for cost-cutting opportunities in stripping—a summary of key questions developed in the field.

	Do You Know Your Cost per Ton?	Have You Analyzed Your Methods?	Have You Checked Equipment Performance?	Are You Regularly Checking on New Ideas?
Drilling	☐	☐	☐	☐
Blasting	☐	☐	☐	☐
Stripping	☐	☐	☐	☐
Coal Loading	☐	☐	☐	☐
Haulage	☐	☐	☐	☐
Road Building	☐	☐	☐	☐
Lubrication & Fuel	☐	☐	☐	☐
Tires	☐	☐	☐	☐
Maintenance	☐	☐	☐	☐
Power	☐	☐	☐	☐
Drainage	☐	☐	☐	☐



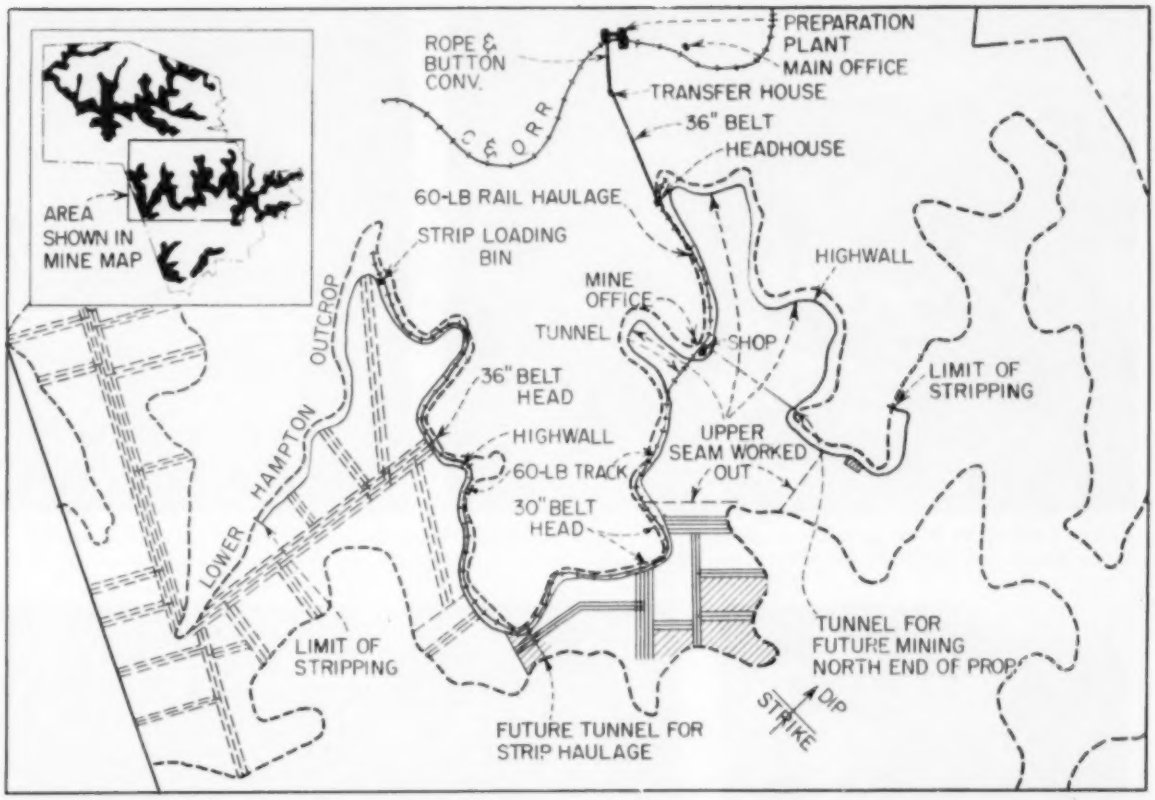
MODERN WASHING, SCREENING AND HEAT-DRYING FACILITIES prepare Hampton Mines coal for market. Left to right are the drier, washer, rock bin, raw-coal screening plant and rope-and-bottom conveyor from a belt unit.



HAMPTON MINES SURFACE LAYOUT, with arrows indicating (left to right) the preparation plant, transfer house between belt and rope-and-button conveyor, declining belt unit, and headhouse receiving coal from 30-ton mine cars.

STRIPPING recovers outcrop coal and prepares the way for underground production with loading machines.

BELT CONVEYORS from underground are supplemented by reversing chain feeders for continuous trip loading.



CONTOUR MINING IN THE HAMPTON SEAM at Hampton Mines, where stripping prepares for final recovery of hilltop coal reserves. Inset shows coal seam in relation to property lines. Tunnels will shorten the mine-car haul in the future.

The Hampton Mines Story

Contour-mining plan employs stripping to develop for machine loading and belt haulage, with 30-ton cars on the surface. Preparation involves preliminary breaking, washing and heat drying of raw carbon.

By J. H. EDWARDS, Associate Editor, Coal Age

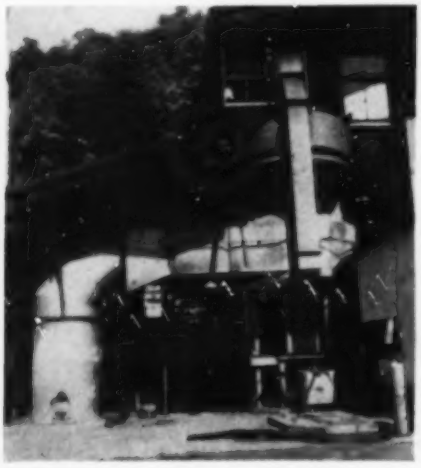
CONTOUR MINING, 30-ton mine cars, belt and rope-and-button declining conveyors, sand-cone washing and heat drying of raw ¼x0 are highlights in the operation of the new mine and 400-tph plant at the Hampton Mines property of the Westmoreland Coal Co., Madison, Boone County, W. Va. The plant serves a coal tract of approximately 10,000 acres from which about 130,000,000 tons is available from four of the mineable seams. Plant construction is in keeping with the long life expectancy of the property.

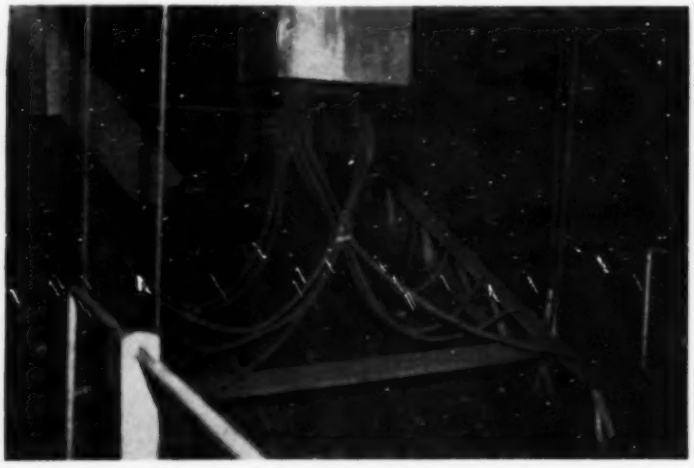
Westmoreland, Inc., a land company, owns the property and the developed areas are under lease to the Westmoreland Coal Co., of which R. H. Knode is president and E. P. Humphrey is executive vice president. This company operates four other bituminous mines in Westmoreland County, Pennsylvania. E. F. Miller, residing at Madison, W. Va., is vice president in charge of operations in West Virginia. The Westmoreland Coal Co. is affiliated with the Stonega Coke & Coal Co. and the Virginia Coal & Iron Co. The General Coal Co., also headed by Mr. Knode, is the sales organization for the mines.

The Hampton Mines property is on Spruce-Laurel Creek in Boone County and includes some acreage in Logan County. The plant, which started shipping in March, 1950, is on the C & O Ry. 20 mi from Madison. Elevations of mineable seams range from approximately 600 ft above the tipple tracks to 300 ft below. The approach to development of the property has been to mine the top seams first and proceed to the lower seams as the upper are exhausted. Present mining is in the Lower Hampton, which is near the top of the series and yields a steam and domestic coal. In the future the company plans to develop seams that will produce coal suitable for by-product markets.

At the headhouse, the elevation of the Lower Hampton seam and of the mine tracks is 1,650 ft above sea level. Elevation of the rails at the preparation plant is 1,057 ft. The first step of lowering the coal from the

EIGHT-CAR TRIP, 30-ton dropbottom cars, on its way to headhouse, where four feeders (right photo) discharge from 75-ton bins to belt extending to rotary breaker at far end. Feeder in foreground can divert rock to mountainside dump.

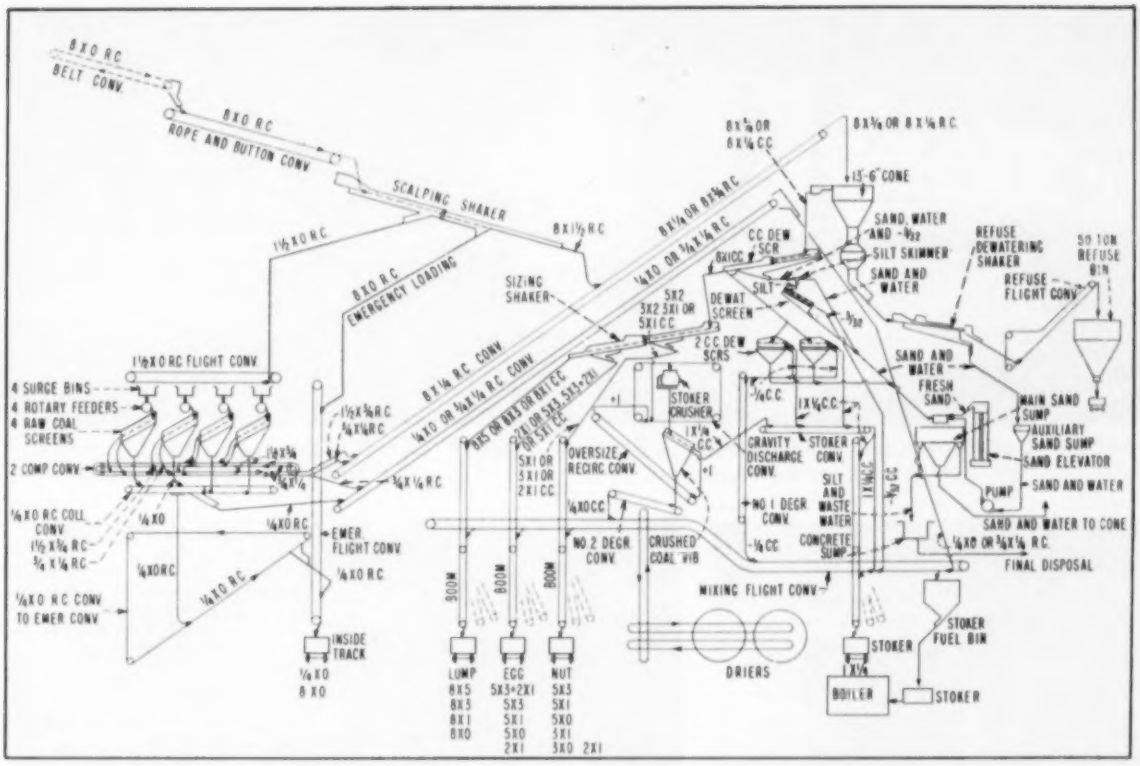




HEAT DRIERS insure uniform moisture in raw ¼ x 0. Electrical heating serves one of four raw-coal vibrators (right).

SAMPLE PREPARATION includes hammermill (left) and crusher in basement of raw-coal screening plant.

TEN SAMPLES being checked in automatic moisture tester in laboratory by H. W. Gilpin, chief coal inspector.


8 X 0 R C BELT CONV
8 X 0 R C ROPE AND BUTTON CONV
SCALPING SHAKER
8 X 1½ R C
1½ X 0 R C
8 X 0 R C EMERGENCY LOADING
SIZING SHAKER
1½ X 0 R C FLIGHT CONV
4 SURGE BINS
4 ROTARY FEEDERS
4 RAW COAL SCREENS
2 COMP CONV
¼ X 0 RC COLL CONV
1½ X ¾ R C
¾ X ¼ R C
¼ X 0 R C CONV TO EMER CONV
¼ X 0 R C
EMER FLIGHT CONV
INSIDE TRACK
⅛ X 0
8 X 0
8 X ¼ OR 8 X ⅛ R C
8 X ¼ OR 8 X ⅛ C C
15'-6" CONE
SAND, WATER AND -1/32
SILT SKIMMER
SAND AND WATER
REFUSE DEWATERING SHAKER
50 TON REFUSE BIN
REFUSE FLIGHT CONV
CC DEW SCR
8 X ¼ C C
DEWAT SCREEN
SILT
5 X 2 3 X 2 5 X 1 OR 5 X 1 C C
2 C C DEW SCRS
SAND AND WATER
FRESH SAND
MAIN SAND SUMP
AUXILIARY SAND SUMP
SAND ELEVATOR
PUMP
SAND AND WATER
SAND AND WATER TO CONE
¼ X 0 OR ¾ X ⅛ R C
FINAL DISPOSAL
8 X ¼ OR 8 X ⅛ R C CONV
¼ X 0 OR ⅛ X ⅛ R C CONV
5 X 1 OR 5 X 1 C C FOR SIZING 5 X 3 + 2 X 1 FOR SIZING
STOKER CRUSHER
1 X ⅛ C C
¼ X 0 C C
GRAVITY DISCHARGE CONV
STOKER CONV
SILT AND WASTE WATER
NO. 1 DEGR. CONV
CONCRETE SUMP
OVERSIZE RECIRC CONV.
5 X 1 OR 5 X 1 OR 2 X 1 C C
¼ X 0 C C
NO. 2 DEGR. CONV
CRUSHED COAL VIB
MIXING FLIGHT CONV
DRIERS
BOOM
LUMP 8 X 5 8 X 3 8 X 1 8 X 0
EGG 5 X 3 + 2 X 1 5 X 3 5 X 1 5 X 0 2 X 1
NUT 5 X 3 5 X 1 5 X 0 3 X 0 2 X 1
STOKER FUEL BIN
STOKER
BOILER
STOKER

COAL-FLOW at Hampton Mines preparation plant.

headhouse is by a declining belt conveyor and the second by a rope-and-button conveyor. The preparation plant, transfer house and rope-and-button conveyor were designed and erected by the Fairmont Machinery Co., except that a Robt. Holmes & Bros. drier annex was recently installed. West Virginia Steel Corp., Charleston, W. Va., designed and erected the structural steel of the headhouse where the 30-ton mine cars are dumped.

PREPARING HAMPTON COAL

Coal handling and preparation start with dumping from dropbottom cars into four 75-ton bins. Coal is taken from each bin by a separate feeder driven through a Link-Belt PIV speed adjuster. One feeder is arranged for discharging mine rock directly to a dump on the mountainside. The other three feeders discharge coal to a collecting conveyor 76 ft long (c-c) equipped with a 48-in Giant No. 1 U. S. Rubber belt. This delivers to a 7x14-ft Bradford breaker (Pennsylvania Crusher Co.) which reduces the coal to 8 in. The product then moves onto a Barber-Greene declining belt conveyor 1,350 ft between centers, with a 239-ft drop to the transfer house. This belt is a 36-in U. S. Giant No. 1 unit and the conveyor rating is 400 tph. For the first 96 ft from the headhouse the belt is in a tunnel lined with Armco 8-ft corrugated circular plates.

Centers distance of the rope-and-button conveyor is 746 ft and the drop is 316 ft. The 10-in buttons are spaced 4 ft apart on a Roebling 1¼-in plow-steel rope, 6-strand, 19-wire, independent wire-rope center, special regular and Lang-lay construction.

The plant is built in two parts with two belt conveyors comprising the transportation between. One building handles the primary screening and provides for emergency loading. The other handles washing, sizing, drying, mixing and regular loading.

Scalping is done on a shaker-type screen 8 ft wide. The 1½x0 from this unit is then divided into three sizes (1½x¾, ¾x¼, ¼x0) by a battery of four 6x12-ft Allis-Chalmers Ripl-Flo screens, one of which is electrically heated. The two larger sizes are reassembled and these together with the 8x1½ overproduct from the scalping screen are carried to the washing plant by a 300-tph conveyor with a 36-in Goodyear Style M belt operating at 300 fpm. Carbon (¼x0) moves to the other building on a 100-tph conveyor, same make of belt, operating at 200 fpm.

GADGETS IMPROVE WASHING AND SCREENING

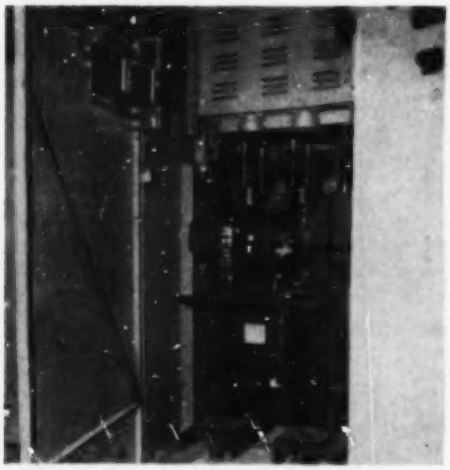
The 8x¼ is washed in a 13½-ft Chance sand-flotation cone. Wooden wedges, half headers and other scrap wood that inadvertently gets into the coal and is not caught by the Bradford breaker is caught in the cone in a submerged basket added by the coal company (p 117).

Clean-coal primary dewatering and desanding screens, and also the clean coal sizing screens, are shaker type. Two distinct improvements have been added by the coal company to the latter. A section of the screen was replaced by an angle-iron grizzly (p 116) which removes flats originating in a thin splint band in the seam. Although not high in ash, this splint would detract from appearance of the 8x5 and 5x3 sizes. Therefore it is crushed to nut and slack. Two of the 5-in round plates of the screen have been arranged so they have 1 in of play (p 117), which prevents clogging previously encountered and requiring the continuous labor of one man to prevent.

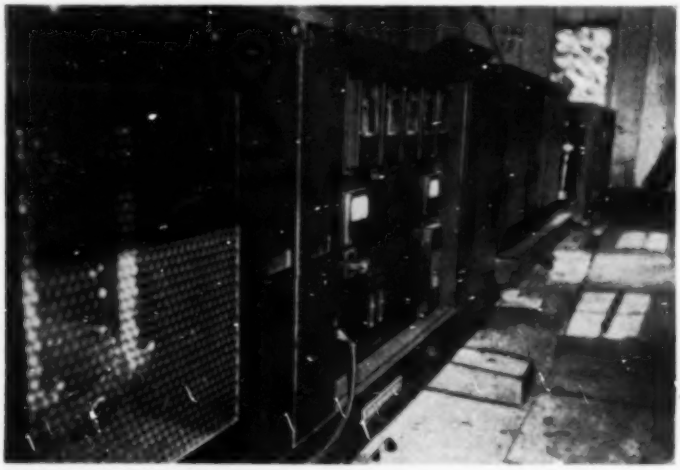
Clean-coal sizes in the range of 5 to 1 inches can be crushed in an 18x60-in single-roll McLanahan & Stone Black Diamond crusher and the product fed to a 6x16-ft Allis-Chal-

DUST-TIGHT CONTROLS serve motors in Hampton Mines plant. This is one of three stations.

AUTOMATIC SWITCHGEAR handling 7,200-v distribution. The operating battery is mounted at the left.



ALL TERMINALS DISCONNECTED in one operation, oil switch is ready to wheel out.



RECTIFIERS PROVIDE POWER for underground mining operations. The unit shown is installed in an outside station.

mers double-deck Ripl-Flo vibrator for separation into plus 1-in, 1x¼ and ¼x0.

The 1¼x¼ cleaned size from the primary dewatering and desanding shaker goes to a battery of two 5x14-ft Allis-Chalmers double-deck Low-Head dewatering screens. A flight-type mixing conveyor, which can receive all sizes, can discharge to a stoker fuel bin and to any of the four loading booms.

Refuse from the Chance cone is dewatered and desanded on a shaker screen and then is deposited in a 50-ton bin from which it is hauled away by a 15-ton Euclid truck. Reject is approximately 13% of the plant input.

Water for the plant is provided by a deep well nearby, equipped with a Deming turbine pump. Some water is taken from the creek. Pumps in the washing plant are Goyne and are three in number: the circulating pump and two sand pumps.

RAW CARBON DRIED

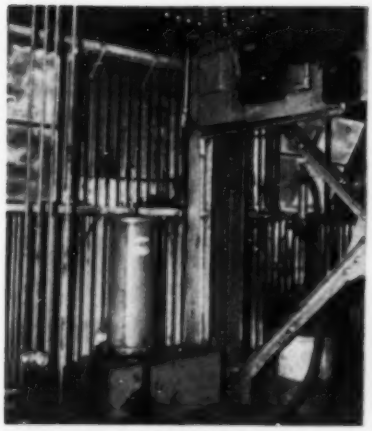
Raw ¼x0 coal is conveyed on through the washer building to two Baughman Verti-Vane thermal driers built by Robt. Holmes & Bros. Each drier is rated at 50 tph of ¼x0 coal. Drying of the raw carbon to turn out a product uniformly low in moisture is necessary principally because of heavy rains in the mine cars while they are being loaded or pulled to the headhouse. A secondary reason is water at times in a few places in the mines. During heavy rains some wet coal also comes from the stripping operations which prepare the highwall and grade for contour mining. Degradation from washing, dewatering and sizing also goes to the driers. Heat for the units is supplied by a Combustion Engineering furnace with a Firite stoker supplying the fuel.

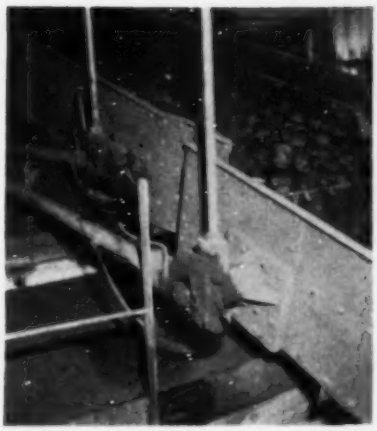
Railroad cars are handled by four Brown-Fayro car retarders and one layer loader. The discharge end of the nut-and-slack boom has been fitted with a plow which is adjustable as to side diversion and depth (p 117) to insure uniform distribution of the dried carbon which rides out on top of the coarse coal.

TESTS CONTROL QUALITY

Samples are taken regularly at the boom discharge while loading nut-and-slack. The sample is caught in a removable trough supported on a boom which is swung manually at considerable speed through the falling stream of coal (p 116).

Samples are prepared in the basement of the raw-coal screening plant by an American Pulverizer grinder and a Robt. Holmes hammermill pulverizer. The laboratory, in the main





CENTRAL STATIONS in the raw-coal screening plant and washer lubricate such units as screen connecting rods.

Hampton-Plant Motors and Drives

Number	Unit	Motor	Horsepower	RPM	Drive
1	Bradford breaker	General Electric	30	875	.....
1	Gathering belt	General Electric	7½	1,755	Link-Belt herringbone
1	Refuse belt	General Electric	15	1,730	.....
1	Declining belt	General Electric	60	1,180	Jones herringbone
4	Feeders	General Electric	10	1,750	PIV gear
1	Button conveyor	General Electric	75	1,185	Falk gear
1	Scalping shaker	General Electric	20	880	Texrope
1	Emergency loading conv.	General Electric	20	1,170	Falk gear
1	R. C. flight conveyor	General Electric	15	1,730	Falk gear
4	Rotary feeders	General Electric	5	855	PIV gear
4	R. C. vibrators	General Electric	10	1,800	Texrope
1	Two-comp. conveyor	General Electric	7½	1,735	Falk gear
1	Collecting conveyor	General Electric	5	1,750	Falk gear
1	Flight conveyor	General Electric	7½	1,725	Falk gear
1	R. C. belt	General Electric	10	1,730	Falk gear
1	R. C. belt	General Electric	30	1,760	Falk gear
1	Chance cone	General Electric	10	880	Phil. reducer
1	Circulating pump	General Electric	100	885	Direct
1	Sand pump	General Electric	40	1,175	Texrope
1	Refuse sand pump	General Electric	25	1,170	Texrope
1	Silt skimmer	General Electric	3	1,145	Texrope
1	Dewatering shaker	General Electric	15	875	Texrope
1	Sizing shaker	General Electric	20	880	Texrope
3	Loading booms	General Electric	5	1,750	Falk reducer
2	Secondary dewaterers	General Electric	10	1,730	Texrope
1	Stoker belt	General Electric	5	1,725	Falk gear
1	Stoker boom	General Electric	5	1,725	Falk gear
2	Degradation conveyor	General Electric	3	1,725	Falk gear
1	Gravity-disch. conveyor	General Electric	25/19	1,180-880	Falk gear
1	Crusher	General Electric	75	1,185	Texrope
1	Crushed coal vibrator	General Electric	10	1,730	Texrope
1	Recirculating conveyor	General Electric	3	1,720	Falk reducer
1	Mixing flight conveyor	General Electric	30	1,760	Falk reducer
1	Sand elevator	General Electric	3	1,725	Falk reducer
1	Refuse-dewatering shaker	General Electric	10	875	Texrope
1	Refuse flight conveyor	General Electric	15	1,730	Falk reducer
1	Air compressor	General Electric	40	1,175	Texrope
1	Deepwell turbine pump	United States	7½	1,800	Direct
4	Boom hoists	Robbins & Myers	..	...	Gear
1	Layer loader	Westinghouse	15	1,675	Gear
2	Drying-plant conveyors	Allis-Chalmers	7½	1,765	Falk reducer
1	Drying-plant conveyor	Allis-Chalmers	10	1,765	Falk
2	Drier rotors	Allis-Chalmers	7½	1,740	Foote gear
2	Drier elevators	Allis-Chalmers	7½	1,740	Falk reducer, non-reverse stop

office building, has modern equipment, including a Brabender semi-automatic moisture tester and separator funnels for making float-and-sink tests. With this new moisture tester the percentage is determined in 20 min, compared to hours by the old method. Ten 10-gram samples are placed in the machine at a time and the total moisture is read directly on a built-in balance.

Construction of the plant is conventional steel framing with concrete floors. Roof and sheathing are corrugated aluminum. Heating is handled by a coal-fired hot-water furnace, and distribution is by unit heaters. For service buildings "on the hill," several Armco Steelox units have been erected. These include a supply house, office for the superintendent and mine foremen, lamp house, three DC substations and a switchgear house for high-voltage distribution.

HAMPTON POWER SETUP

Connected horsepower of 63 principal motors in the plant is 910, including headhouse and declining conveyors. The largest motor is 100 hp and drives the washer circulating pump. The next in size is a 75-hp motor driving and retarding the rope-and-button conveyor. These and most of the other motors in the plant are General Electric, 440-v, totally-enclosed, fan-cooled. Westinghouse motors drive the Bradford breaker and layer-loading hoist, Allis-Chalmers motors drive the drier equipment and a U. S. motor drives the deepwell pump. Controllers in the screening and washing buildings are General Electric in dust-tight cases. One group handles the screening-plant motors and two groups handle the washing plant.

Purchased power for Hampton Mines is distributed at 7,200 v through a fully-automatic General Electric switchgear assembly providing for four outgoing circuits, two of which have been installed. Oil switches are pull-out type and are operated by battery power.

Eighteen 15-kva 440-v General Electric capacitors are installed on the lines. Six are at a substation comprising three 150-kva Westinghouse transformers at the screening plant, six at the headhouse and six on another line.

Three DC substations have been installed. Two have single units consisting of 300-kw Westinghouse Ignitron rectifiers. A 200-kw General Electric m-g set near the shop is used principally for power in testing overhauled DC machinery.

MORE ➡

STRIPPING TO PREPARE highwall and track grade for contour mining is done with 5½-cu yd diesel shovel.

CONTROL OF STRIP QUALITY is provided by cuttings from this unit drilling from highwall to crop every 50 ft.

FOUR 25-TON 150-HP DIESEL-ELECTRIC LOCOMOTIVES handle mine-car haulage around the outcrop.

RUBBER-MOUNTED MACHINE using tungsten-carbide bits cuts coal for loading in underground operations

STRIPPING PRECEDES MINING

The highwall and bench for openings for underground mining and for track haulage are prepared by stripping, contracted to the Central Pennsylvania Quarry, Stripping & Construction Co. The coal company maintains close control over the quality of the coal from this stripping operation, which runs about 500 tons per day. This is done by seam sampling and closely defining the areas of good-quality coal to be loaded. Making use of the contractor's Le Roi 105 Tractair compressor and drill unit, brought to the mine primarily for drilling boulders, the coal company drills a series of holes every 50 ft in the uncovered coal starting at the highwall and spaced 10 to 20 ft apart. A bag over the top of the drill hole catches the coal blown up from the drill bit. These samples give an accurate average for the cross section of the seam.

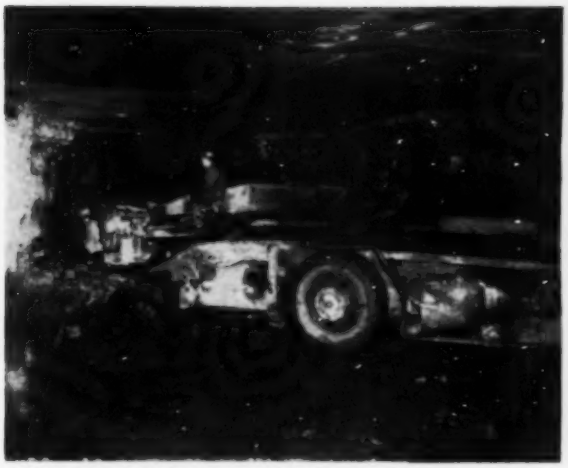
The contractor strips to a 50-ft depth with one Lima diesel shovel with 5½-yd Esco dipper. One pass of the shovel opens up the crop for horizontal drilling, and the next pass, after shooting, finishes the digging. Loading is done with a Bucyrus-Erie 2½-yd shovel and the haulage along the pit bottom and to the car-loading point is done with 15-ton Euclid trucks.

Mine-car equipment, which operates on 60- and 80-lb rails around the stripping outcrop and through two short tunnels, consists of 50 30-ton 5-door ACF dropbottom cars. Motive power consists of four General Electric 25-ton 150-hp diesel-electric locomotives. At the loading points the trips of 30-ton cars are spotted by Brownie hoists.

DEEP MINING MECHANIZED

The Lower Hampton seam averages 65 in in thickness and the range in the section where the underground photographs were taken is 65 to 84 in. One mainline belt conveyor discharging to the outside is a 36-in Goodman unit, Type 99AT36. All other belt conveyors are 30-in Type 97FC30.

Cutting equipment consists of three Sullivan 11RU rubber-mounted universals and two Goodman 512 shortwalls with Goodman trucks. All cutters are equipped with Cincinnati chains using Joy throwaway bits. Coal-drilling equipment consists of three Sullivan double-arm CD26 self-propelling rotary electric drills and



SWING-MOTION LOADER puts coal in 3-ton shuttle car for trip to mother belt leading to the outside.

COAL-DRILLING UNIT is a double-head self-propelled machine fitting into the trackless setup underground.

SLATE MEMBERS IN TOP are bound into beam by ¾ x 30-in expansion-shell bolts.

NEWEST OPENING at Hampton Mines, after site is prepared by stripping, is fitted with 36-in mainline belt.

several Jeffrey A7 hand-held drills, all using tungsten-carbide bits.

Five Goodman 660 swing-motion crawler-mounted loaders constitute the coal-loading equipment, and two Joy 8BU loaders handle rock loading and also load some coal. The Joy shuttle-car fleet consists of three 3-ton 6SC units and eight 2-ton 32E units. Roof-bolting is done with Chicago Pneumatic RBD drills. Cap-lamp equipment consists of 225 Edison R4 lamps supplied by Mine Safety.

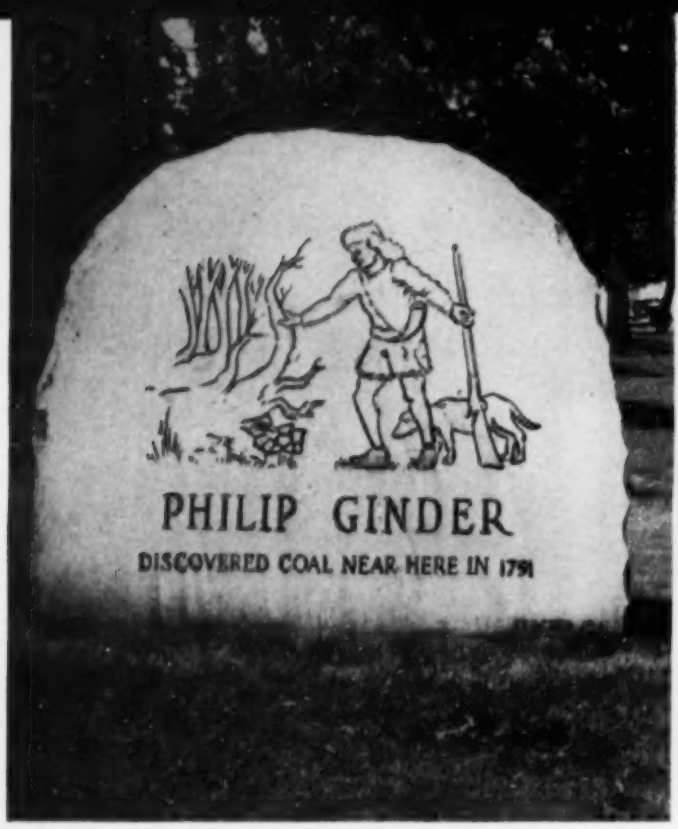
Entry headings are driven 12 to 14 ft wide on 50-ft centers. A main usually is driven with five headings. The belt is installed in the center heading, and the side headings are used as aircourses. Room entries consist usually of three headings, also 12 to 14 ft wide on 50-ft centers. Belts serve in some of the room entries and chain conveyors in other. Rooms are driven 22 ft wide on 30-ft centers.

Cutting for the most part consists of two horizontal cuts, one at the bottom and the other about 3 ft above the floor in an especially-low-ash band which, mixed with the cuttings from the bottom coal, raises the quality of the total cuttings. Shot holes are placed above the upper cut, three being located near the top and two at a lower elevation. The shooting is done with du Pont permissible.

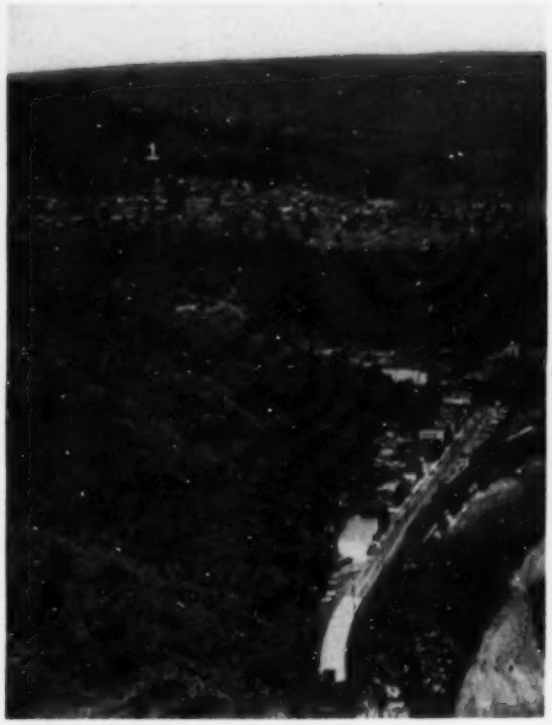
Working places are roof-bolted in the production cycle. The bolts, furnished by West Virginia Steel & Mfg. Co., are ¾x30-in, expansion-shell type, with ⅜x6x6-in washers of the keyhole type for quick assembly. In this mine the duty of the bolts is to bind the shale together rather than suspend the immediate top from a stronger stratum.

C. J. Robinson is superintendent of the mines, Fred Morrison is general mine foreman and M. H. Coffey is maintenance foreman. Glen Hyer is preparation foreman and John Dolin is night tipple foreman. W. H. Hanlon is engineer for the company, R. D. Rosenberry is chief clerk, and H. M. Gilpin is chief coal inspector and laboratory technician.

The company has erected a spacious and permanent office building of brick construction within sight of the preparation plant. Eleven modern dwelling houses have been built near the confluence of Pond Fork of Little Coal River and its tributary Cazy Fork. These houses on the property are currently occupied by foremen, mechanics and electricians.



1791 **THE STORY OF SUMMIT MINE** goes back to the night in which Nimrod Philip Ginder discovered an anthracite outcrop under a fallen tree while crossing Sharp Mountain.



1953 **MAUCH CHUNK TERMINUS**—This composite photo of the river loading area, taken from impressive

The First 160 Years at Summit Hill

THE WORKINGS IN THE SUMMIT HILL BASIN of the southern anthracite fields, operated by Lehigh Navigation Coal Company, Lansford, Pa., make up the oldest active coal mine in America. More than 150 yr of operation have been rung up with the end of the project nowhere in sight. The end probably will come, one LNC engineer observes, not from imminent exhaustion of the resources, but when some future generation becomes less interested with Summit Hill mining.

The story of Summit Hill mining of course is the story of men—the men who found the coal, the men who developed the industry in the face of crushing problems, and the men who have kept it going while continuing to wrestle with many of the same problems.

By HAROLD DAVIS
Assistant Editor, Coal Age

The parallel problems, then and now, are (1) effectively promoting anthracite to secure a wider market, (2) finding the cheapest possible ways to get the coal to marketing centers, (3) increasing the efficiency of mining and handling through mechanical means, (4) utilizing the finer sizes and (5) combatting natural hindrances, such as fire and water. And all the while the old timers were solving these problems in their times through the application of good ideas, the smug ones stood aside with their hands folded, saying "It can't be done." They ate their words more than a few times.

Let's go to the record.

The year is 1791. Philip Ginder, a professional hunter, is hurrying home through the rain over Sharp Mountain in the wilderness of eastern Pennsylvania. He trips and falls into a mess of unusual black stones, and though perhaps annoyed by the fall, he has sense enough to take one of the stones home for closer examination.

That's how it all began at Summit Hill. Ginder undoubtedly had heard stories of the black stones that burned, so he took the specimen to Col. Jacob Weiss at Fort Allen near the Lehigh River about 10 mi from the point of discovery.

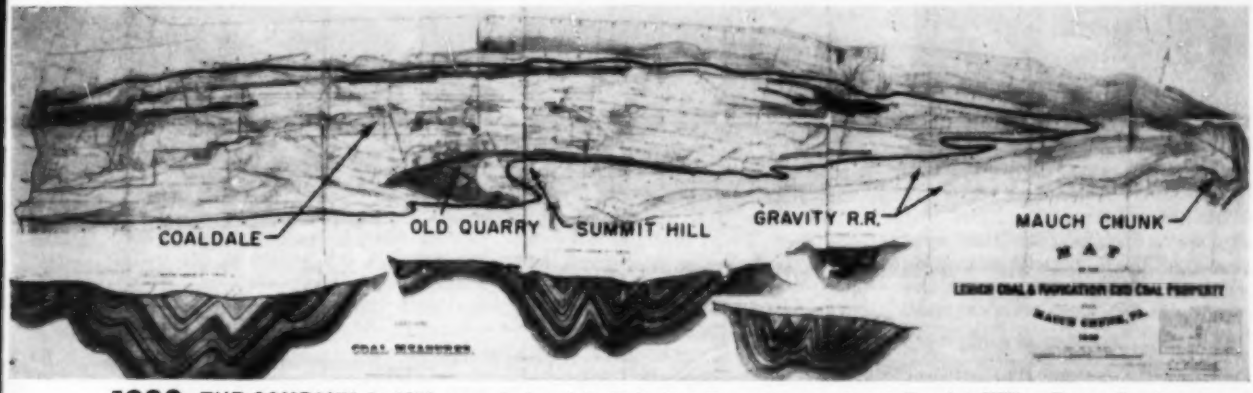
Colonel Weiss was interested enough to take the black stone to Philadelphia.

There he showed it to Michael Hillegas, first treasurer of the infant U. S. republic, and Charles Cist, a printer. They pronounced it hard coal, and the three men formed a company, the Lehigh Coal Mine Co., to recover and sell the fuel.

Then the uphill struggle began. Concerning these earliest efforts, the September, 1857, issue of Harper's Magazine, in an article entitled "Coal and the Coal Mines of Pennsylvania," has this to say:

"A few pits were accordingly sunk down, and several tons of the mineral quarried, when the great question presented itself to our enterprising company—'What are we going to do with it?' . . . Standing upon their seam of coal on the summit of Sharp Mountain, seventeen hundred feet

Flagstaff Mountain Park near Mauch Chunk, shows (1) Mount Pisgah, where one of the planes and the switchback railroad were built, (2) the approximate loading point where mine cars were dumped into arks, (3) the bed of the old Lehigh Canal, (4) the foundations of an old weighing house and (5) Mauch Chunk Mountain, the "sleeping bear."



1869 **THE COMPANY,** in 1868, commissioned R. P. Rothwell, engineer and metallurgist, Wilkes-Barre, Pa., to prepare a true survey of the company's holdings. This is a photocopy of an original print of Mr. Rothwell's map.

above tide water, the Lehigh Coal-Mine Company looked wistfully over the vast expanse of mountain, valley, and plain, and up to the arching firmament for a market."

The promotion problem was a big one.

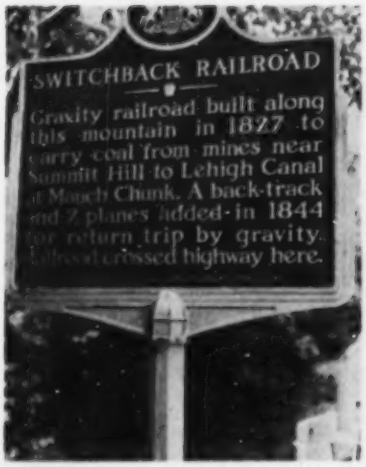
Most people thought the black stones would not burn. Colonel Weiss carried some with him in his saddlebags, giving samples to blacksmiths in an effort to get them to try the new fuel in their forges. On some occasions he was called a swindler and mountebank, and was forced to return home by roundabout routes.

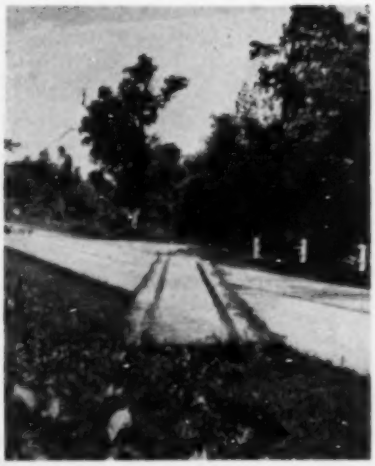
Mining languished for a few years; it might be said that the most enthusiastic response to the promotion efforts was apathy. Wood was the favored fuel.

During this period the partners in the company permitted anyone to mine coal for themselves on the company's tract with the object of making the product more widely known. Furthermore, increasing numbers of blacksmiths were converted to its use. But the big Philadelphia market had not yet materialized. In the meantime, a 9-mi wagon road had been built from the mine at the summit to a loading point on the Lehigh River.

When the War of 1812 struck, developments tumbled over each other. Other fuels became scarce and prices soared. Therefore, the company scheduled another crack at the Philadelphia market. Cist and two other partners had the lease now.

Accordingly, in 1813, five arks bearing 100 tons each left the loading point for the journey down the Lehigh to Easton, then down the


SWITCHBACK RAILROAD
Gravity railroad built along this mountain in 1827 to carry coal from mines near Summit Hill to Lehigh Canal at Mauch Chunk. A back-track and 2 planes added in 1844 for return trip by gravity. Railroad crossed highway here.



1827-44 **ENGINEERING HISTORY** was made on the 9-mi run from Summit Hill to Mauch Chunk where a uniformly-graded haul road and railroad were in use more than a century ago. Remnants of Mount Jefferson plane and the old engine house (right) still are landmarks at Summit Hill.

THE MODERNIZERS **ROBERT V. WHITE** (left), President, Lehigh Coal & Navigation Co. **EVAN G. EVANS**, Board Chairman, **GLENN O. KIDD**, President, Lehigh Navigation Coal Co.

Delaware to Philadelphia. Three were doomed in the Lehigh rapids, however, and only two survived the run to what was then the Nation's capitol.

The pace quickens now.

Much of the 200-ton shipment was sold at $21 per ton to the firm of White & Hazard, manufacturers of nails and wire products. In this perfect partnership, Josiah White, a husky Quaker, is the driving engine and Erskine Hazard is the flywheel which smoothly transmits White's impulsive actions to those with whom they deal.

White and his men charged their firebox with anthracite, but in spite of all their stoking and agitating they could not get it to burn. The accounts tell how they slammed the doors of the furnace in disgust and left the plant for the night. A few hours later one of the men returned to retrieve a coat he had forgotten only to find the firebox full of incandescent heat. The firm of White & Hazard had found the secret—put anthracite on the briskly burning kindling, give it air, and leave it alone.

Four years later, in 1817, Josiah White himself was in the Lehigh Valley to get a firsthand look at what the opportunities might be. Cist and his partners had given up the lease in the meantime because the high cost of transportation had ruined them. White was interested in maintaining an uninterrupted flow of fuel for his furnaces, but when he saw the challenge at Summit Hill and in the Panther Valley and on the Lehigh River, everything else took second billing. At the age of 36, and after having retired once, Josiah White had found his life's work. As a young man in the hardware business, White had vowed that he would save $40,000 by the time he became 30 yr of age, then he would retire to a country place to spend the rest of his life doing good works as his conscience might dictate. He reached the goal with time to spare, but on him retirement did not set well.

White, Hazard and G. F. Hauto now formed a partnership to take over the mining lease.

The annual rent was one ear of corn for the use of the property and they were required to ship to market 40,000 bushels of coal per yr after the third year.

Putting first things first, White and his associates realized that mining was not the big problem; the coal could be quarried at the surface. The big roadblock was transportation from the mine to Philadelphia, and waterways came naturally to mind because a road through the wilderness was out of the question.

In the Spring of 1818, White and Hazard explored and surveyed the

THE FOUNDERS **JOSIAH WHITE** (left), manager, 1822-50; President, 1841. **ERSKINE HAZARD**, Member, Board of Managers, 1822-65.

Lehigh River from its headwaters above what is now White Haven to its confluence with the Delaware at Easton, 47 mi on foot through rough country.

Their survey proved to their satisfaction that the Lehigh, turbulent though it was, could be used to transport the coal to the larger river. The next hurdle was that of securing financial backing—$50,000 worth to pursue a project in which others had failed several times before.

After the usual vicissitudes of soliciting risk capital, the $50,000 was raised to continue the improvement of the Lehigh which had already begun. As often as not, Josiah White operated on faith in the ultimate rightness of what he was doing.

Of his experiences with prospective investors during the capital-seeking days, White wrote in his notebook:

"John Stille sd politely, how do you do, Sires, how do you come on with the Lehigh, and before we could give him an answer, he proceeded to read his news paper; altho we bid him, good afternoon, he was so much engaged at reading the chit chat occurrences of the day that he had no time to bid us goodnight." There were many other rebuffs, but finally John Stoddart, with a reputation as a canny investor, came in and that induced others to follow.

The turbulent Lehigh River had to be tamed.

The early work on the river consisted of building diversion walls out of stones in the bed to direct the available water to the more navigable side of the channel. But an untimely drought demonstrated that such measures did not go far enough. White was forced to admit to himself that locks would have to be built although he had hoped to get by without them.

It was determined in the beginning that locks of the conventional type in use on other waterways would be impractical in the Lehigh navigation project because of the steep gradient of the stream. The locks would have to rise to unheard-of heights. But Josiah White came up with an idea—"Bear-Trap" locks.

The Bear-Trap lock, patented by White, was a brilliantly-conceived arrangement which permitted the coal-carrying arks to be floated across rapids on the crest of a surge of water. The bear-trap lock consisted of an upstream reservoir which fed a stone trough. In the bottom of the trough was a pair of upwardly-sloping, overlapping doors. The pressure of the water as it entered the trough depressed the doors, and at a certain time the ark was carried out of the lock and over the rapids on the artificial flood. The only control was a one-man gate for feeding the water out of the reservoir into the lock; the remainder of the operation apparently was automatic. Thus, the river itself operated the bear trap, while in conventional locks the gates had to be shut against the pressure of the water. By the end of 1819, 12 bear traps were in operation on the Lehigh.

Simultaneously, the old 9-mile wagon road from Summit Hill to the loading point on the river was being improved. White and Hazard surveyed the route with a level and produced what probably is the first graded road in America, designed especially for high-capacity haulage. When the road was finished, two horses could haul 6 tons over it, a remarkable performance in view of the 1,000-ft difference in elevation between the mine at the summit and Mauch Chunk, the loading point.

Perhaps in the back of his mind Josiah White already had the vision of laying one of those new-fangled railroads on this graded ramp.

Sure enough in 1827 he did just that. It was the first "permanent" railroad in the country, since it operated until 1933. It was preceded only by the 3-mi Quincy railroad and one other abandoned road in a quarry.

The cars rolled by gravity from the mine to the river and the empties were hauled back to the mine by mules which rode down with the loads. The time required for the return trip soon created a bottleneck in the transportation system. Therefore, a return road was laid. Two planes in the return road permitted the cars to be hauled to a high elevation to take advantage of long gravity runs back to the mine. One plane rose at Mount Pisgah, near Mauch Chunk, and the other at Mount Jefferson near Summit Hill.

Still later, the switchback system was added to rapidly lower loaded cars to the loading point, and thereafter the entire road became famous as the "Switchback" railroad. Descent of the cars on the switchback was controlled by rising sections of track on which the cars stopped and reversed their direction. Spring loaded switches then would shunt the cars to the next lower section of track. The switchback also was White's idea.

In 1820, with the road and the bear traps in operation, the company shipped 365 tons to Philadelphia, but indications are that the coal was "dumped" at about $8.50 per ton. White and Hazard were advised to take it easy the next year; they were glutting the market. However, in the next year they sent 1,000 tons—and it sold! The partners were of the opinion that they should demonstrate the limitless nature of their product and they figured 1,000 tons on the Philadelphia wharves would do the job. It did. In 1825, they shipped 28,500 tons.

Engineering problems were not the only concern of the partners.

They solved administrative and executive problems too. In setting up to do business and secure financial backing, they had to form two companies, the Lehigh Navigation Co. and the Lehigh Coal Co., because

some investors had faith in the canal but not in the coal operations, while others held the opposite view. In 1822, they merged the two companies into the Lehigh Coal & Navigation Co. and incorporated. That was 131 yr ago, and that's why the anthracite LNC sells today is trademarked "Old Company's Lehigh Anthracite."

Throughout this period, they were forced to petition the legislature for charters and permissions, with Hazard smoothing the solonic feathers so often ruffled by White in his impatience to launch new projects.

Nor was cost control neglected. In his annual report for 1827 to stockholders, Manager White wrote:

". . . 146 railroad waggons have been made, and the utility of the road proved, by transporting on it 27,770 tons of coal, at a saving over the turnpike road of 64¾c per ton, which, after deducting the interest on the cost of the improvement, has produced a saving this season of more than $15,000. There has also been a saving in raising the coal and in the boating department together of 16c per ton; thus reducing the cost of our coal, this year, more than 80c per ton."

Floods and fire plagued the operators at times. On at least two occasions the violent Lehigh swept the man-made navigation improvements away. Each such occasion would provide an understandable excuse for quitting, but scant months later the coal would be moving down the river as before.

As 1847 came around, production from the quarry could no longer satisfy the demand for Lehigh anthracite and the first slope was sunk from the outcrop of the Mammoth seam. It was only 12 yr later that a fire was discovered in Summit mine, and this one burned until 1909, when it was finally brought under control through the completion of a massive clay barrier during the presidencies of W. A. Lathrop and E. D. Warriner, older brother of J. B. Warriner, now senior director of the coal company and himself a former president of the coal company during the difficult years from 1930 to 1947.

The interesting record runs on; there never was a dull moment. Price wars raged with the operators in the Schuylkill region. Wage arguments came up from time to time, especially after the war ended in 1865.

But there were solid achievements, too, and the problems sound familiar.

In 1848 customers already were complaining about the size consist. The company in that year installed breaking, screening and sorting equipment at Summit mine.

The fine sizes, pea and smaller, were consigned to the waste dump until 1858, when the company converted the boilers of the inclined plane engines to permit colliery use of the pea coal. Also in this year 40-lb iron was substituted for wooden rails on the descending road.

Next came the water problem. Since 1847, as previously mentioned, mining at Summit Hill had gone underground. Water in the openings became the production bottleneck. Come 1864, the water problem was a real headache. A new generation of engineers tackled the problem, however, and large Cornish pumps began to make their appearance in the anthracite region. (Josiah White had passed away in 1850 and Erskine Hazard was about ready to pass the managerial reins to younger hands.) And from that time until now, anthracite demands the most efficient pumps that can be produced.

Obstacles in the way of efficiently transferring energy also reared up. These were surmounted by building large underground boilerrooms. Summit mine in 1865 had such a boilerroom containing six 30-ft-long boilers.

In 1860 an improved breaker was built at Summit Hill. And annual production was near 600,000 tons per yr from Summit mine and newer mines in Panther Creek Valley.

The concept of turning coal into electrical energy at the mine mouth is not really new. About 1912, the "Old Company" built the Hauto power plant for the express purpose of sending energy to market through power cables rather than over rails. S. D. Warriner and his predecessor as president, W. A. Lathrop, sparked this development.

Throughout all these years, coal continued to pour from Summit mine.

In the earliest days, the 70-ft-thick Mammoth vein was quarried, making "sunshine mining" one of the marvels of the day. Then slopes became the vogue. The slopes were somewhat shallow, but even as today, level gangways were driven along the strike of the vein and breasts were driven up the pitch to cause the coal to flow into the cars in the gangway. Although the methods may be similar to those in use until quite recently, the habits of the workmen were quite different. They kept their black powder in kegs under their beds!

The full cycle at Summit Hill was completed in recent years when huge machines returned to the site of the 18th century quarry and opened the famed Summit Hill strippings. Now the strippings are a shadow of their former size, but underground mining continues in the Summit Hill basin. No. 9 Tunnel now is the major opening.

In 1868 the company commissioned its first comprehensive property survey to R. P. Rothwell, a Wilkes-Barre engineer. His map is shown in one of the accompanying illustrations. In 1905 the company wondered about its future reserves. A survey showed over 500,000,000 tons yet to be mined in the Panther Creek and allied basins.

So much for the history of the oldest active mine in America.

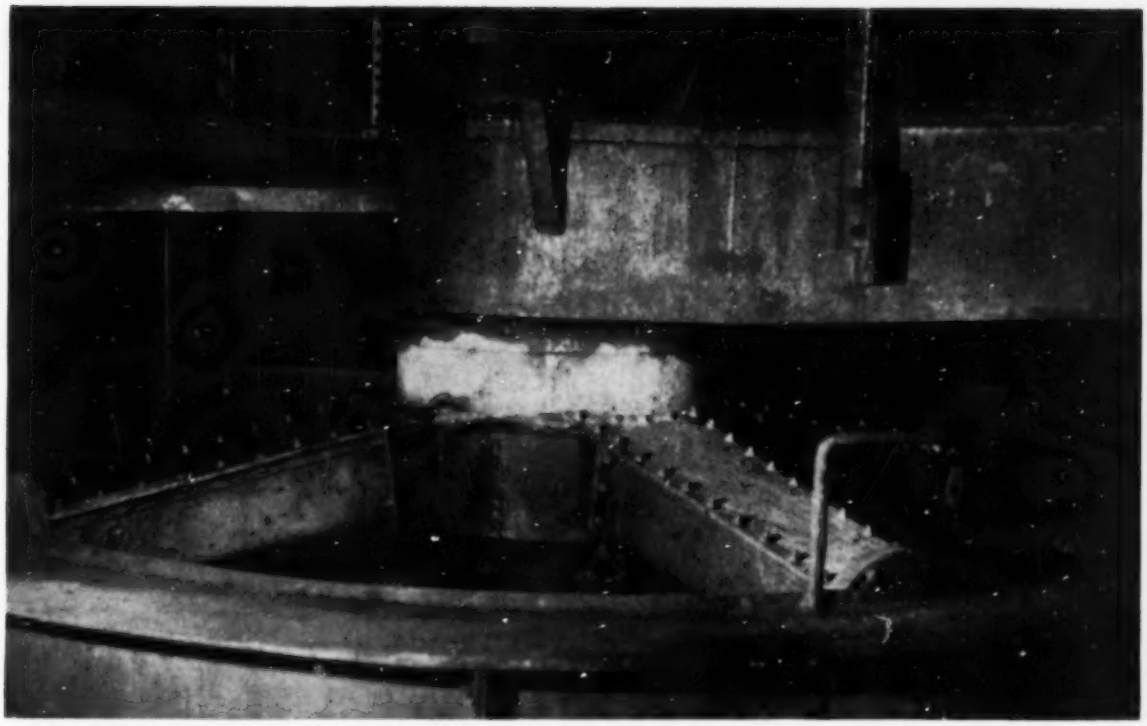
The achievements of the present management team must await evaluation by the next generation of probing editors, except for such day-by-day developments as improved fine-coal cleaning, better rock disposal and long-hole mining.

There is adequate proof, however, that the problems of 1953 are being squarely faced. Sales promotion and quality control leaven the thinking of the operating and preparation departments of the company. Mechanization under extremely tricky conditions is getting its share of study. A new industrial engineering department has been organized to serve as a long right arm of the general manager's office. New ideas are forthcoming and receiving due consideration. The "Old Company" apparently is good and ready to face the next century and a half in full recognition of the fact that problems never get any easier nor less numerous. And Lehigh anthracite continues to issue from Summit.

Acknowledgements are in order . . .

To D. C. Helms, vice president, for permitting us to search out data in the Lansford offices of the company, and to F. E. Sterner, mining engineer; Chester Hirsch, chief draftsman; and Fred Myers, industrial engineer, for providing historical documents and the old maps. Messrs. Sterner and Myers also provided copies of *Josiah White, Prince of Pioneers*, by Eleanor Morton; *The Story of the Old Company*, and *My Years in Anthracite*, by J. B. Warriner. Ted Berger, LNC's public-relations counsellor, provided the presidents' photos.

An expression of sincere appreciation also is tendered F. S. Riordan, attorney-at-law, Lansford, Pa., for his company and comments on a tour of the Summit Hill area, and the management of Flagstaff Mountain Park at Mauch Chunk, where the accompanying photos of the river-loading area were taken.



HIGH THROUGHPUT WITH EFFICIENT DEWATERING characterizes the radial screens used at Jacobi colliery, in Germany, which are preceded by partitioned screens and discharge to centrifuges for final step in moisture removal.

How Radial Screens Raise Dewatering Efficiency

High throughput with good dewatering characterizes German dewatering setup embodying radial and partitioned screens feeding to centrifuges, where dewatering results depend largely upon particle size.

By Dipl-Ing. EDUARD BROCK, Essen, Germany

NEW DEWATERING EQUIPMENT– a combination of partitioned and radial screens–has shown good results with high throughput capacities at the Jacobi mine in the German Ruhr. The partitioned and radial screens are followed by centrifugal driers, and investigation of the factors affecting their operation in conjunction with tests of the partitioned and radial screens showed that dewatering results depend largely upon particle size. Among other things, therefore, a high proportion of fine particles increased the moisture content of the centrifuged coal.

In comparison with mechanically operated dewatering screens, the partitioned and radial screens pass on relatively small percentages of oversize particles, meaning, at Jacobi, no extra load on the flotation equipment giving the fines their final cleaning. The higher specific capacity of the partitioned screen has led to the idea of redesign of both it and the radial unit to reduce size without reducing dewatering effectiveness, and thus make them more practical units for use ahead of centrifuges.

Jacobi mine is a coking-coal producer and Ruhr coking plants now request a moisture content significantly below the 10% average now prevailing. The goal for maximum economy in coke-plant operation is 6 to 8%. This goal can be achieved with mehcanical dewatering equipment.

DEWATERING PLAN

Reineveld centrifuges, or "Drying Dutchmen," are used at Jacobi for dewatering the fine coal. They generally require a moisture content of not over 30% in the feed. Since the flow from the washers represents 6 to 8 times the quantity the centrifuges can receive and perform efficiently, preliminary dewatering is necessary. At Jacobi, this preliminary dewater-

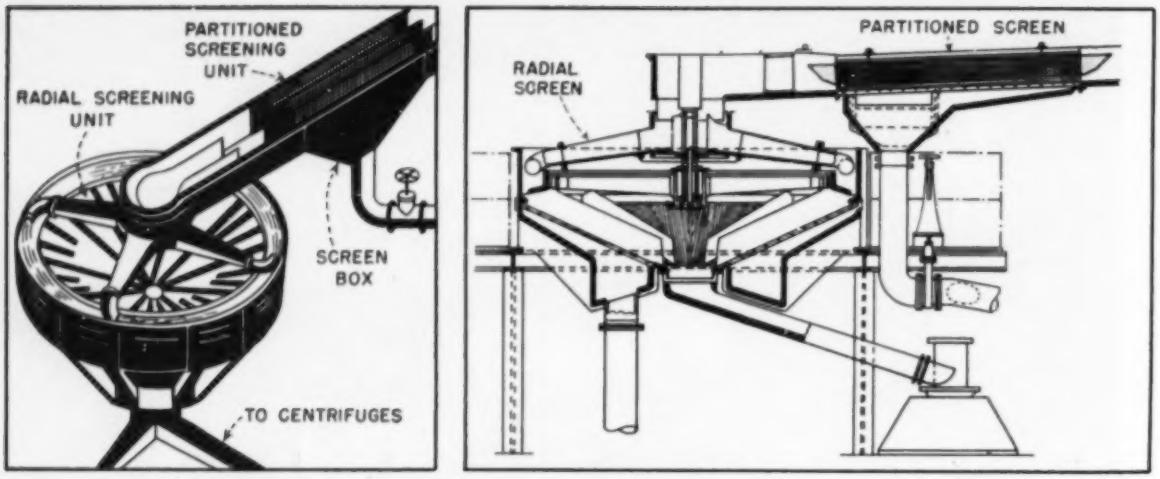


FIG. 1—DESIGN FEATURES of the partitioned and radial screens used for dewatering fine coal.

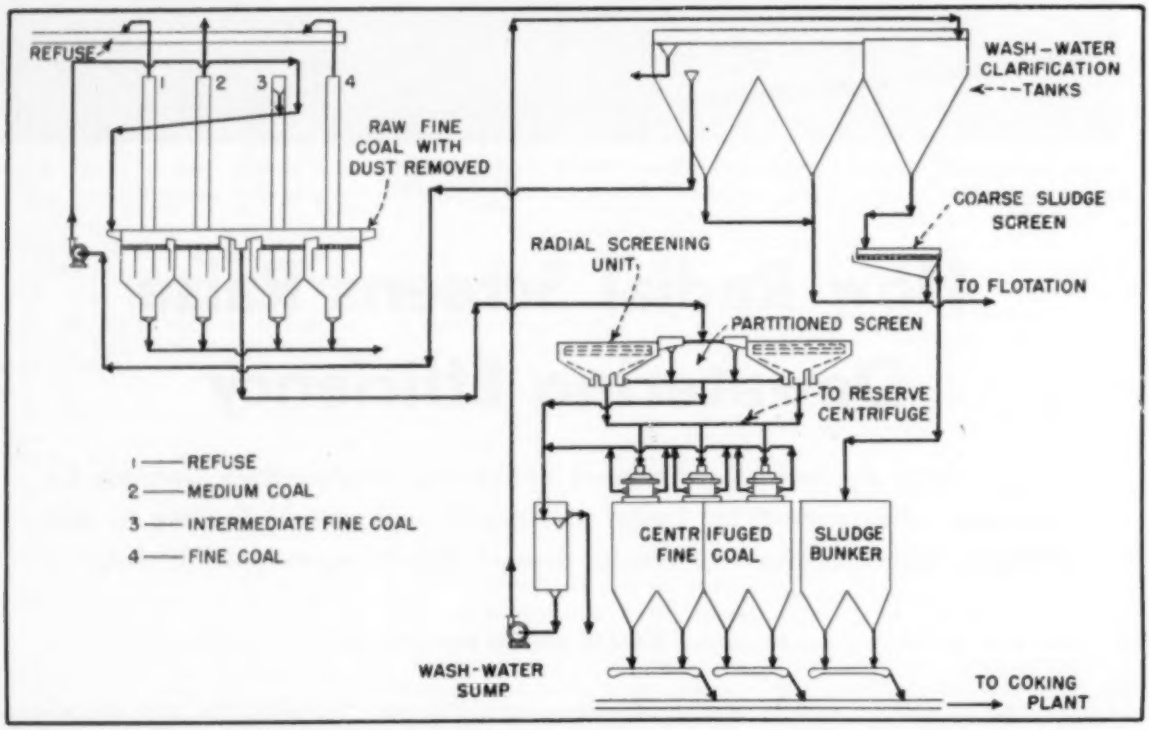


FIG. 2—HOW PARTITIONED AND RADIAL SCREENS are incorporated into the drying circuit in the Jacobi fine-coal washing plant. Final centrifuging is improved by the addition of these units to the moisture-removal circuit.

ing is done by a radial screening plant preceded by partitioned screen units, all provided by Hein, Lehmann & Co.

The fine-coal washing and dewatering process at Jacobi is shown in Fig. 2. The feed is dry ¼-in x 0.25-mm coal bypassed around the coarse-coal washers and processed to remove the minus 0.25-mm dust. The coal first goes to a primary washing unit—an air-operated wet-sieve jig made by SKB. Middlings, as shown, are routed to a second machine for final treatment.

Clean coal from both jigs is flumed to two radial screening plants, each preceded by a box or partitioned screen. Both the radial and partitioned units are equipped with slotted screens. Slot width is 0.0197 in, or ½ mm. The centrifuges which follow the radial and partitioned screens are equipped with ½-mm round-hole screens.

The turbid, or coal-carrying, effluent from the radial and partitioned screens and the centrifuges goes to a wash-water sump and from there is pumped to a settling tank. The thickened sludge from the settling tank then goes to flotation units for final treatment. In this way, the loamy very-fine particles are removed from the wash water and thereby from the coking coal before it finally goes to the coking plant.

Table I—How Partitioned Screen, Radial Screen and Centrifuge Performed in Dewatering Tests

	Test 1	Test 2	Test 3	Test 4	Test 5
Slide opening in box under partitioned screen, sq. in.	6.82	10.23	13.8	20.31	26.67
PARTITIONED SCREEN					
Feed, Tons per Hour:					
Coal	130.96	103.7	123.6	122.3	101.2
Water	395.04	328.8	461.3	437.5	465.3
Total	526.00	486.5	584.9	559.8	566.5
Per cent water	75.2	78.7	78.9	78.2	82.1
Per cent −0.5 mm.	54.8	42.7	49.5	50.6	39.4
Through, Tons per Hour:					
Coal	14.11	16.7	27.0	37.7	27.0
Water	63.75	134.3	224.5	251.2	262.6
Total	77.90	151.5	251.5	288.9	289.6
Per cent water	81.9	89.0	89.3	86.9	90.3
Per cent −0.5 mm.	95.1	92.2	94.3	95.6	91.2
RADIAL SCREEN					
Feed, Tons per Hour:					
Coal	116.85	87.0	96.6	84.6	74.2
Water	331.25	248.5	236.8	186.3	202.7
Total	448.10	335.5	333.4	270.9	276.9
Per cent water	73.9	74.1	71.0	68.8	73.2
Per cent −0.5 mm.	49.9	33.2	36.9	30.5	20.6
Through, Tons per Hour:					
Coal	54.55	26.0	32.3	23.4	13.7
Water	281.15	213.9	203.4	157.2	175.1
Total	335.70	239.9	235.7	180.6	188.8
Per cent water	83.8	89.1	86.3	87.1	92.7
Per cent −0.5 mm.	97.4	96.3	96.7	97.4	94.9

	Test 1	Test 2	Test 3	Test 4	Test 5
CENTRIFUGE					
Feed, Tons per Hour:					
Coal	62.30	61.00	64.3	61.20	60.50
Water	50.10	34.62	33.4	29.07	27.56
Total	112.40	95.62	97.7	90.27	88.06
Per cent water	44.6	36.2	34.2	32.2	31.3
Per cent −0.5 mm.	8.3	6.3	6.3	5.0	3.8
Through, Tons per Hour:					
Coal	9.30	3.97	5.50	3.86	3.63
Water	46.60	31.18	29.50	25.28	23.87
Total	55.90	35.15	35.0	29.14	27.50
Per cent water	83.4	88.7	84.3	86.8	86.8
Per cent −0.5 mm.	98.0	96.7	96.4	99.4	93.4
Centrifuged Coal, Tons per Hour:					
Coal	53.00	57.03	58.8	57.34	56.97
Water	3.50	3.44	3.9	3.79	3.69
Total	56.50	60.47	62.7	61.13	60.56
Per cent water	6.2	5.69	6.2	6.2	6.1
Per cent −0.5 mm.	13.8	15.5	9.0	16.4	14.0
PER CENT TOTAL COAL FEED REMOVED WITH WATER BY:					
Partitioned screen	10.8	16.1	21.8	30.8	26.7
Radial screen	41.6	25.1	26.1	19.1	13.5
Centrifuge	7.1	3.8	4.5	3.2	3.6
In final product	40.5	55.0	47.6	46.9	52.6
PER CENT TOTAL WATER IN FEED REMOVED BY:					
Partitioned Screen	16.1	35.1	48.7	57.4	56.4
Radial screen	71.2	55.9	44.1	35.9	37.7
Centrifuge	11.8	8.1	6.4	5.8	5.1
In final product	0.9	0.9	0.8	0.9	0.8

DEWATERING EQUIPMENT

The partitioned screening unit, or box screen, as shown in Fig. 1, has three compartments. The length is 78.7 in; width, 23.8 in. Effective screening area, including risers or partitions, is 41 sq ft. Water and fine coal through the screens is caught in a box with two air-vent tubes. A slide governs the quantity of coal and water leaving the screen box.

The radial screening unit has a diameter of 11.48 ft and an effective screening area of 88.15 sq ft. The screening surface consists of a number of radial screen segments, with each segment bent into the form of a cone-shaped shell. The result is a screen form with an enlarged effective area. Discharge is through a port in the center. As the coal slides down toward this center port, it is piled up with increasing force, which promotes the dewatering process.

The centrifuges (Fig. 3) have a screen cage with a bottom diameter of 36.46 in and a top diameter of 23 in. Cage height is 18 in. Effective screening or dewatering area is 1,395.35 sq in. The scrapers for removing the dewatered coal are set

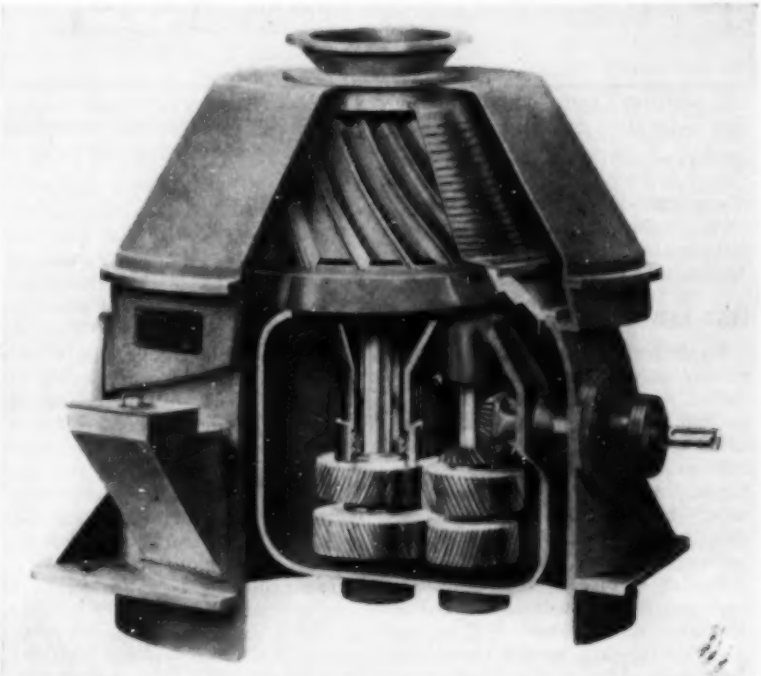


FIG. 3—"DRYING DUTCHMAN," or fine-coal centrifuge, used for the final dewatering step in fine-coal preparation at the Jacobi plant in Germany.

Table II—Specific Throughput Capacities of the Partitioned and Radial Screens

	PARTITIONED SCREEN		RADIAL SCREEN	
	Test 3, 13.8-sq in slide opening	Test 5, 26.67-sq in slide opening	Test 1, 6.82-sq in slide opening	Test 3, 13.8-sq in slide opening
Throughput, Tons per Hour:				
Turbid water	243.500	289.600	335.700	243.500
Solids	29.650	27.000	54.550	29.650
Water	213.900	262.600	281.150	213.900
Effective screening area, sq ft	7.23	9.25	88.2	88.2
Specific Throughput Capacities, Tons per Sq Ft per Hour:				
Turbid water	30.7	25.6	3.48	2.53
Solids	3.74	2.39	0.57	0.31
Water	27.0	23.6	2.91	2.22

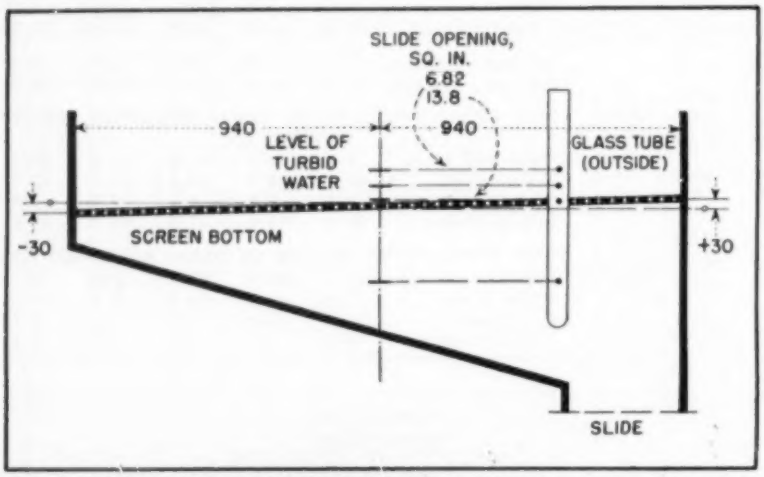


FIG. 4—HOW LEVEL OF TURBID WATER was affected by various slide openings under the partitioned screen in the test program to determine dewatering results at the Jacobi plant in Germany.

at a specific distance from the screen-cover surface, depending upon the particle size and the consistency of the coal being dewatered.

TEST SET-UP

To determine the efficiency of the various units in the dewatering circuit, a series of five tests lasting 4 hr each was conducted, using one radial screen and one centrifuge for test purposes. Different loads were imposed on the radial screen and centrifuge by changing the size of the slide opening in the box under the partitioned screen.

During the tests, the centrifuge was operated at a constant speed of 602 rpm. Starting with 6.82 sq in. the slide openings in the screen box were increased successively an average of 6.51 sq in to 10.23, 13.80, 20.31 and 26.67 sq in.

TEST RESULTS

The results of the five tests are summarized in Table I. As shown in Fig. 4, the water level in the screen box was above the bottom until the slide opening exceeded 13.80 sq in, thus reducing the throughput of both coal and water and consequently increasing the load on the radial screen and centrifuge, particularly in Test 1. After Test 1, however, the radial screen was able to reduce the load in Tests 2 and 3 to levels only moderately higher than in the final two tests with the water level below the bottom of the partitioned screen.

The ability of the radial screen to remove water and fine solids is shown in Test 1, where the capacity of the partitioned screen was reduced by a high level of water. In this test, the radial unit removed 41.6% of the total coal feed and 71.2% of the water by weight. As more of the bottom surface was uncovered by increasing the slide opening and dropping the water level in the partitioned screen, the latter screen became more and more effective in removing water and coal under ½ mm.

The partitioned and radial units were about equally effective in Test 3. With larger slide openings, the partitioned screen removed more of both coal and water, reducing the load on the radial screen. However, regardless of the feed to the radial unit, its percentage removal of water fed to it was about constant at 85% throughout all the tests in spite of the lower pressure head.

From the third test on, the partitioned screen relieved the radial screen to such an extent that 93 to 94% of the water fed to the partitioned screen was removed up to the feed point of the centrifuge. The solids withdrawal in the partitioned and radial screens reflected particle size and therefore varied from 40 to 53% of the quantities introduced.

With the centrifuge included, dewatering rose to 99% of the total feed to the partitioned screen. The exact range was 99.1 to 99.2%. The fact that the percentage remained the same throughout the tests reflects the reserve capacity of the centrifuge—with a clear screening area of 1,395.35 sq in—which permits equally good results with a fairly substantial excess of water.

It was determined by probing tests that the critical range for water in the coal feed to the centrifuge lies between 45 and 50%. Between 25 and 45%, the centrifuge has a very high dewatering efficiency and will yield relatively uniform and low water contents in the centrifuged coal under conditions anywhere near normal.

The centrifuge produced dried coal equivalent to 40.5 to 56.2% of the feed to the partitioned screen with a moisture content ranging from 5.7 to 6.2%, the higher figure reflecting an increase in the percentage of centrifuged coal relative to the charge. This means that 43.8 to 59.5% of the feed to the partitioned screen was withdrawn with the water. This may seem surprising in view of a centrifuge capacity of 56.6 to 62.7 tph. It must be remembered, however, that the water withdrawn from the coal carried solids up to 0.99 lb per gal or more. This results from a solids build-up caused by recirculation of the wash water, after partial clarification, back to the washer. Naturally, it carries a charge of fine solids with it. The proportion of particles in these solids generally is 80% less than 0.0029 in, and there are no particles larger than 0.0197, or ½ mm. Therefore, most of these solids go through the various screens with the water being removed.

As a result, the solids entrained in the wash water are kept out of the coking coal until they are recovered and cleaned by flotation.

SCREENING CAPACITY

Maximum capacity of the partitioned screen, in terms of water throughput, was reached in Test 3. It was not possible to reach higher feed quantities during the last two tests. Consequently the maximum capacity of the partitioned screen could not be determined. Maximum capacity of the radial screen was reached in Test 1. No attempt was made to see if a further increase in radial-screen capacity was possible, but in view of the water throughputs of the centrifuge, particularly in Test 3, when the centrifuge was relieved to a greater extent by the higher preliminary capacity of the partitioned screening unit, it may be assumed that the radial screen reached maximum capacity in Test 1.

The tests showed that screening units preceding the centrifuge can withdraw very large quantities of water carrying very fine solids derived, in the most part, from the wash water. Calculated specific screening capacities with slide openings under the partitioned screen of 6.82, 10.23 and 26.67 sq in are shown in Table II, based on equal withdrawal of water by the partitioned and radial units at an opening of 10.23 sq in, at which point only 0.77 sq ft of the bottom screen is effective, making the total effective area 7.23 sq ft, including the sidewalls or risers, compared to 10.33 sq ft with all the bottom uncovered. These three slide openings (6.82, 10.23, and 26.67) represent, respectively, the maximum throughput of the radial screen, equal throughput of both screening units, and maximum throughput of the partitioned screen.

On this basis, with the same throughput quantities, the specific screening capacity of the partitioned screen is calculated as 74,014 lb of turbid water and 9,017 lb of solids per square foot per hour. Corresponding figures for the radial screen are: 7,077 lb of turbid water and 740.14 lb of solids. The maximum capacity of the radial screen was 8,371 lb of turbid water and 1,364 lb of solids.

This capacity of the radial screen, in view of the high proportion of very fine particles, is higher than that of mechanical screens, while the partitioned screen, with 61,542 lb of turbid water and 5,745 lb of solids per square foot per hour, exceeds these values by far, this in spite of the fact that solids removed with the turbid water at a slide opening of 26.67 sq in was smaller than with an opening of 13.8 sq in because of a lower concentration of 1.86 lb per gal in the feed.

In addition, the low content of oversize particles in the solids (or coal) throughput of the partitioned and radial screens also is an advantage. The oversize content of the partitioned screen throughput was 4.4 to 8.8% in the tests, and that of the radial screen 2.6 to 5.1%. Oversize in the throughput of mechanical screens generally is 15 to 20%.

DEGRADATION AND LOSS IN CENTRIFUGING

The tests showed that 10 to 17% of the dry-coal charge to the centrifuge is reduced in size to less than ½ mm. The characteristic value changes from an average of 0.118 to 0.08 in.

The greater part of the fine particles formed in this process remain in the fine coal, since, with a screen covering that is not worn, only the quantity of fine coal contained in the coal charge goes into the effluent. This was particularly shown in Test 2. It is not until the screen covering becomes fairly worn that fine coal formed in the centrifuge unit is lost.

In Test 1, for example, solids smaller than ½ mm in the throughput through the screen were 14.6%, compared to 8.4% in the charge to the extractor. In this test, total solids throughput was 14.9%, reflecting advanced wear of the screen plate, which normally has a life of 17,600 to 18,700 tons of centrifuged product. In the following tests, solids throughputs (under ½ mm) were 6.3, 8.3, 6.3 and 5.7%, compared to feed percentages of 6.1, 6.7, 4.8 and 3.7%.

The reduction in particle size therefore is of secondary importance from a pure upgrading point of view. More important is the solids throughput of the screen, which depends on screen wear. It normally lies between 4 and 6% of the dry-coal charge, but can rise to 15% with advanced screen wear.

It must be noted in this connection that if the preliminary dewatering of washed fine coal is insufficient, water in the centrifuge feed can rise to 45%. As this is clarified wash water—not clear water—increased water extraction in the centrifuge must be purchased at the expense of higher solids withdrawal. This was shown in Test 1, where more water and fine-particle solids were introduced to the centrifuge. In this test, centrifuge solids throughput from solids carried in the recirculated wash water was 8.3% of the dry-coal charge, compared to 6.6% from preliminary crushing of the coal.

One therefore cannot speak of a loss of solids in the dewatering of washed fine coal in centrifuges because the withdrawal of solids is mainly dependent upon particle size and on the capacity of the preceding dewatering equipment. With the partitioned and radial screens, the wash water with fine-grained solids already is withdrawn satisfactorily ahead of the centrifuge with little increase in oversize particles. The solids do not become coarser even when the screen in the centrifuge is worn to an appreciable degree.

It can be concluded that the most important result of the dewatering test is that the success of dewatering with the centrifuge under other important conditions than those previously discussed depends mainly upon particle size, because, in spite of the varying loads placed on the dewatering system, total water withdrawal from the coal remained fairly constant at approximately 99%. If the proportion of very fine particles in the solids charge is fairly high, the percentage of residual water in the centrifuged coal must then increase.

★ ★ ★

Whisker density on the male face varies from 235 to 780 per square inch and the stubborn stuff insists on growing about 15/1000th of an inch per day.

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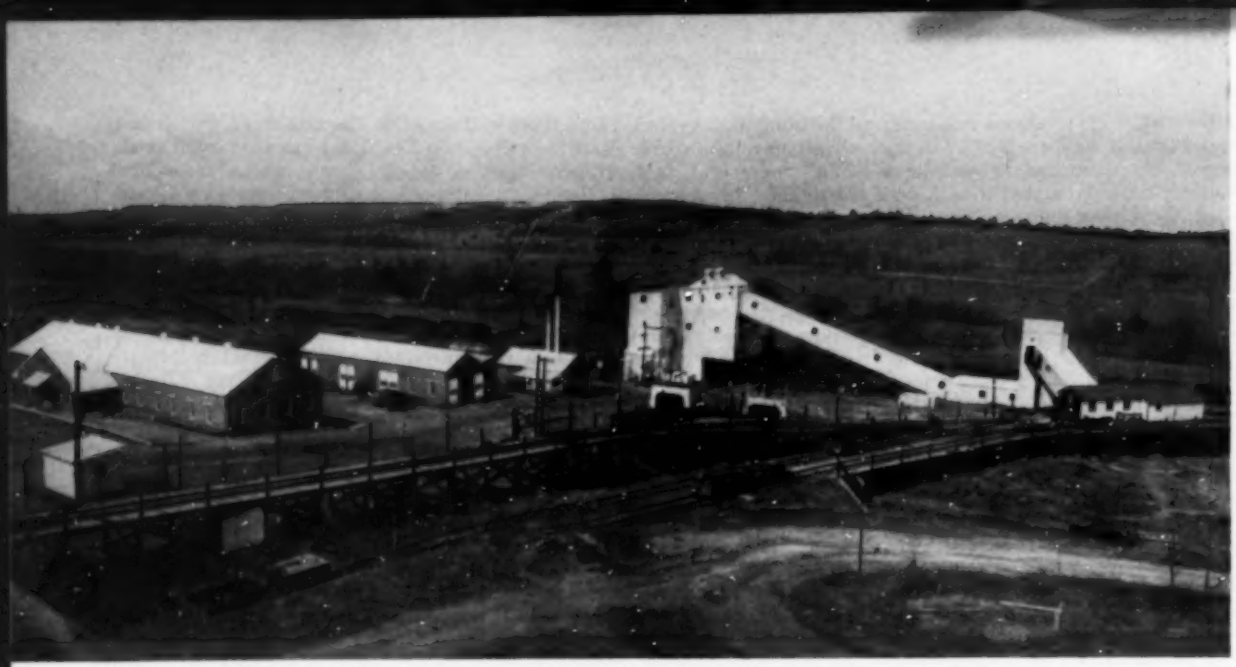


MODERN FACILITIES at Lone Star's Carbon No. 5 mine include bathhouse (left), shop (center) and preparation plant. Bathhouse and shop are of brick construction. Coal is hoisted up slope (center) in 4-car trips.

How Lone Star Steel Solves Tough Mining Problems

Application of modern methods plus emphasis on safety and good employee relations help Lone Star produce a high-quality coking coal.

STRESSING SAFETY and good employee relations, the Lone Star Steel Co., McAlester, Okla., applies modern equipment and methods to combat adverse mining conditions at their Carbon No. 5 and McCurtain mines. Lone Star deep mines 855 tpd of high-volatile coal at its Carbon No. 5 mine and 800 tpd of medium-volatile coal at McCurtain. This captive tonnage is mixed with high- and medium-volatile strip coal purchased from other producers and the blend is used to make coke for the Lone Star steel mill at Lone Star, Tex., 200 mi from the mines.

Successful mining of Lone Star high-quality coking coals contributes greatly to the profitable operation of the steel mill even though relatively low-grade Texas ore is used.

Developed with government funds in 1941 to furnish coking coal for two Texas steel companies, one of which was Lone Star, the present mines produced coking coal throughout World War II until August, 1945. The property remained idle until the spring of 1947, at which time Lone Star purchased it from the government and began mining operations. Shortly thereafter, in 1948, Lone Star initiated a training program in safety, mining, first aid and mine rescue to upgrade employee performance and skill. In addition, a program to promote better employee-employer relations has been developed. Proof of the success of the program is reflected not only in a greatly improved safety record but also in 10 mo of operation without a grievance case. Management points with pride at these achievements and aims for continued improvement in the future.

MANAGEMENT TEAM

Management of Lone Star Steel is headed by E. B. Germany, president. W. H. Johnson is executive vice president and Walter P. Moreland is vice president, sales. These officers headquarter in Dallas, Tex. W. R. Bond is vice president, operations, and L. D. Webster is vice president, employee-public relations. These officers headquarter at Lone Star, Tex. General superintendent of coal properties is Campbell Cameron, with G. R. Eadie as his assistant. Julius Fowler is mine engineer, Douglas Cameron is preparation engineer, and H. C. Rice is office manager. Lone Star's safety program is headed by B. L. Curry, safety engineer.

Carbon mine is managed by A. W. Schneider, superintendent. Arthur Nolen is first-shift mine foreman, Ray Warren is in charge of the second shift, and Tom Holt is third-shift foreman. Robert Greer is first-shift top foreman, and John Budzinsky is second-shift top foreman. Buck Reynolds is chief electrician at No. 5.

George Shields, superintendent, is in charge of the McCurtain operation. Leo Robertson is first-shift mine foreman, Robert Thompson is second-shift foreman, and Fernon Clouse is third-shift foreman. Top foreman duties are handled by Lloyd Beck, and maintenance is under the direction of John Pinamont, chief electrician.

Mining at No. 5

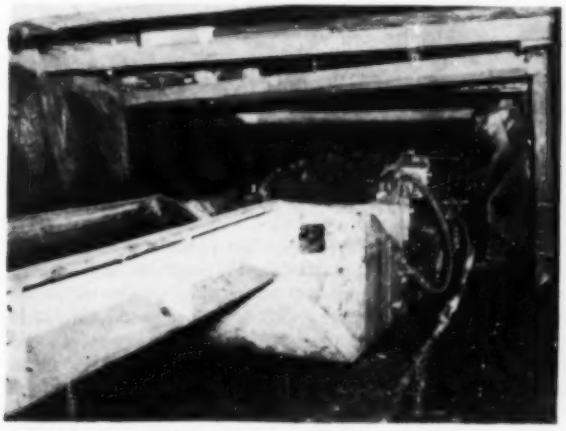
Mining at the Carbon No. 5 mine is in the 36-in McAlester seam, which is

TOP SHOT FOR CLEARANCE in room panels at No. 5 is gobbed neatly along the belt. Minimum height is 48 in.

ALL-BELT HAULAGE from room panels to the sidetrack near the slope is featured at McCurtain mine.

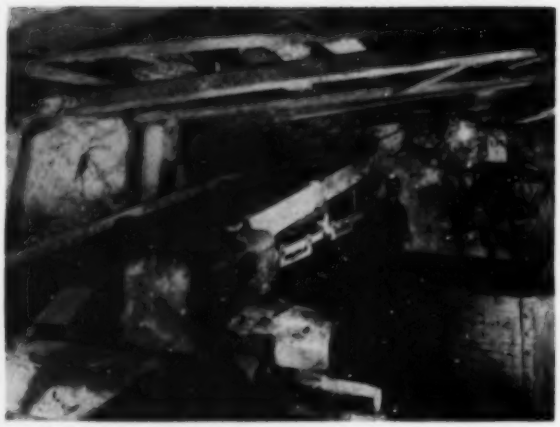
THICKER COAL AT MCCURTAIN permits men to move about easier, but roof must be held by crossbars.

FAULTS ARE COMMON in both mines. Displacement of the coal is as great as 30 ft and makes grading costly.



BRIDGE CONVEYOR AND LOADER are used at McCurtain to increase output in areas where top permits.

CHAIN CONVEYORS are used to carry coal from working faces to belt conveyors. Close timbering is required.



BELT CONVEYORS deliver coal to 5-ton all-steel mine cars, hauled to slope by 7-ton battery locomotives.

MAIN ENTRIES AT CARBON, driven on the strike, are heavily timbered. Bottom is taken to get 7 ft of clearance.

HIGH-PRESSURE FANS (left) deliver large quantities of air to mine workings. Auxiliary 118-hp gasoline motors are kept in readiness in event of a power failure.

free of impurities except for a ⅛-in parting in the middle and a ½-in band of high-ash coal at the bottom. Overlying the coal is a friable shale which requires heavy timber support. A medium-hard fireclay underlies the coal. The mine is gaseous and mining is further complicated by the fact that the coal lies in a basin dipping 9 to 19 deg, with faults in many areas. Displacement of the coal has been as great as 30 ft, making mining difficult and development costly. Present workings are 800 ft below the surface.

Development of the mine was by a four-entry slope following the dip of the coal seam. Right and left production entries are developed in groups of five along the strike at right angles to the main slope. From these, three-heading belt-room panels are developed on the pitch and 20-ft rooms on 45-ft centers are driven 300 ft deep on the strike. All development openings are driven 14 ft wide on 50-ft centers. Bottom is lifted in track entries to provide a minimum of 7 ft of clearance, while belt headings are brushed to 48 in. Rock is loaded out in slope and main-entry development and is gobbed along the belt heading in room panels.

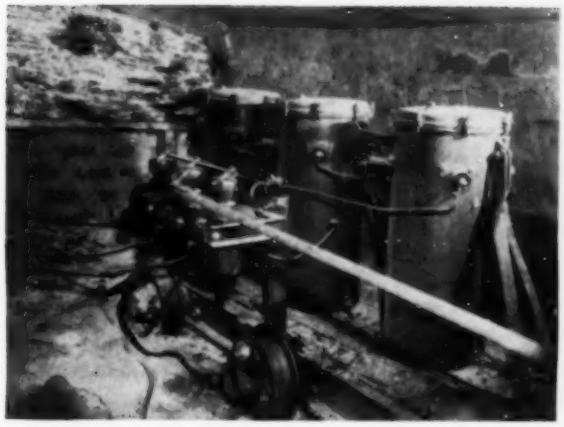
Production at Carbon comes from seven working sections, each of which consists of four rooms or four headings. All sections work on the day shift but production is limited to 30% of capacity on the night shift.

Almost all the roof requires timbers on 3-ft centers, with safety jacks, on like centers, set at the face. This restricts face equipment to shortwall cutting machines, chain conveyors and hand-held electric drills. Belt haulage in the room panels permits close timbering and eliminates the need to brush large quantities of rock.

A typical room crew is made up of a machine man and two loaders who handle miscellaneous preparation jobs such as drilling, timbering and extending panlines. A greaser and shotfirer are assigned to each four working places to handle greasing and shooting. A shift leader supervises all work in the four working places.

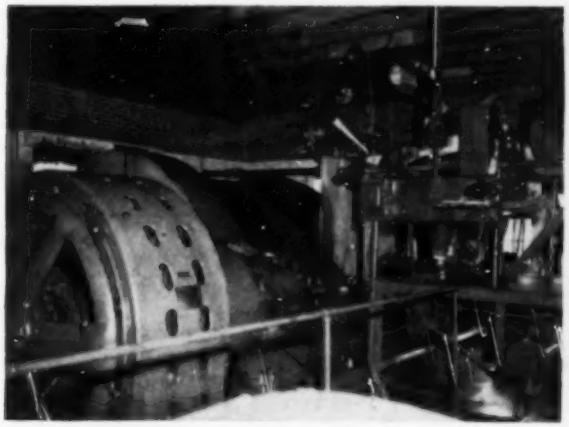
Panlines in rooms are located on the low side of the room one-third of the room width from the rib. Each room also is equipped with a 220-v AC cutting machine, hand-held 220-v AC drill and 15-in chain conveyor. Working places are undercut to a depth of 6½ ft after the machine sumps in the dip side of the room. Water is sprayed on the cutterbar to prevent fine coal dust from getting into suspension in the air, and timbers and roof jacks must be moved and replaced as cutting proceeds. In all cases it is a company practice to have another timber or jack set before one is removed in front of the machine.

Four holes, each charged with 2 sticks of Hercules Red HB powder, are drilled in each cut of coal. After blasting, the coal is first loaded from



POWER for underground AC section equipment is supplied by three transformers close to the working area.

LOCOMOTIVE BATTERIES are charged after each shift. Charging stations are located near producing sections.



COAL IS HOISTED to the surface by an 800-hp unit at McCurtain and by a 1,000-hp unit at Carbon No. 5.

ROTARY DUMP transfers raw coal from all-steel mine cars to storage bin before it is delivered to the washer.

the area immediately in front of the conveyor to permit extension of the panline as quickly as possible. Loading proceeds to the machine sumping side so that the cutting cycle may be started as soon as possible and finally ends at the uphill side of the room. Timbering is a continuous part of the loading cycle, with timbers being set on 3-ft centers and closer if necessary.

Coal from the room conveyors discharges directly to 30-in panel belts which deliver it to 5-ton solid-body steel mine cars. All belt heads are equipped with sprays to suppress dust around the loading point. Haulage to the slope is by 7-ton battery locomotives, which deliver 10 loads to the sidetrack and pick up a like number of empties.

A Vulcan cylindrical-drum hoist powered by a 1,000-hp General Electric induction motor and equipped with 6,500 ft of 1¼-in rope delivers coal to the surface in 5-car trips. Ample mine cars are on hand for storage of second-shift coal so that hoisting is required only on the day shift.

HAULAGE

Slope and mainline track is 42-in gage and is laid with 67-lb rail on 5x7-in by 6-ft ties treated with 0.3 lb of Wolman salts per cubic foot of wood. Secondary track is laid with 40-lb rail on 5x6-in by 6-ft untreated ties. Entries are double-tracked at all belt-loading points to permit quick trip changes.

AC POWER SYSTEM

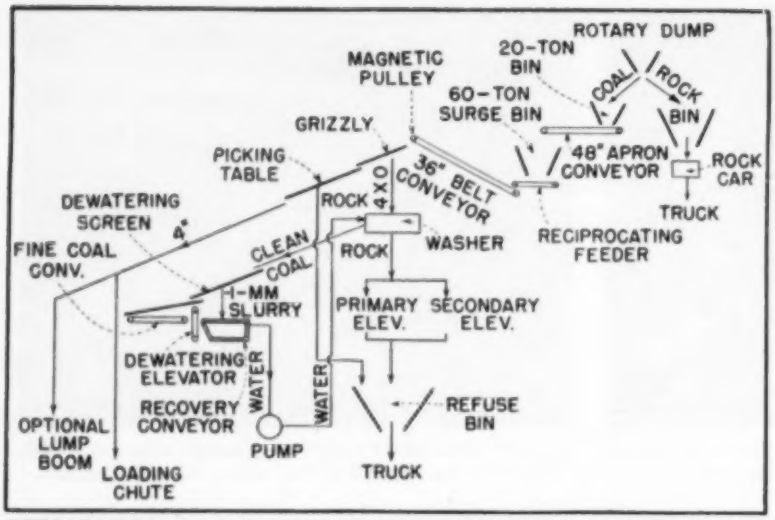
Power, purchased from Public Service Co. of Okla. at 22,000 v, is delivered to three General Electric 500-kva transformers, which reduce it to 2,300 v for delivery to the mine. Each section is provided with three General Eiectric Pyranol or Westinghouse Inerteen transformers, which deliver 220-v AC current to section equipment. Protection against grounding is provided by Wells ground-fault trips located on each working section. When a main entry and room panel are being developed close together, three 75-kva units serve both sections but normal procedure is to have three 50-kva units for each four working places.

SUPPLYING THE MINE

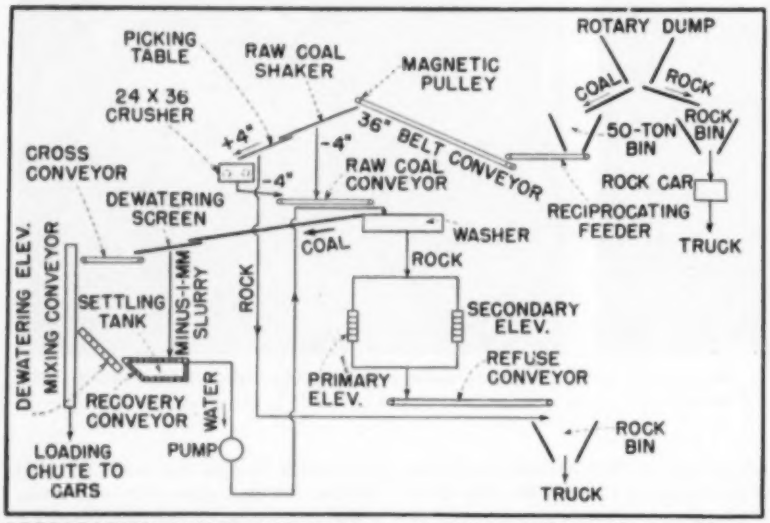
A special 17-man crew distributes all mine supplies on the third shift. Supply cars are loaded as much as possible on the first or second shift, and sent to underground sidetracks for distribution on the third shift. The entire system is geared to getting maximum production during the working shift by having all supplies at the working places when the loading crews report for work.

PREPARATION AT NO. 5

Raw coal is delivered to a McNally-Pittsburg single-car rotary dump, which discharges to a 20-ton raw-coal bin. Mine rock is also dumped



PREPARATION at Carbon No. 5 includes handpicking of plus 4-in size and jig washing of 4 x 0. All output goes to Lone Star Steel mill in Texas.



PREPARATION PLANT at McCurtain has facilities similar to those at No. 5, but includes crusher for breaking R-O-M to minus 4-in. Plant reject is 22%.

Table I—How Lone Star Coal Analyzes After Cleaning

	Carbon	McCurtain
Moisture	5.73	4.92
Volatile Matter	35.93	23.97
Fixed Carbon	57.46	67.79
Ash (std. 6-7½)	6.61	8.24
Sulfur	0.51	0.87

Table II—Typical Section, McAlester Bed

	Ft	In
Coal	..	1½
Parting	..	..
Coal	1	4½
Parting	..	⅛
Coal	1	5⅜
High-ash coal	..	½
Total thickness	3	0

Table III—Typical Section, Hartshorne Bed

	Ft	In
Coal	..	7½
Parting	..	½
Coal	..	1
Parting	..	½
Coal	..	6
Parting	..	¼
Coal	..	2¼
Parting	..	¼
Coal	..	4¾
Blue middle band	..	2
Coal	..	8½
Parting	..	¾
Coal	1	10¼
Carb. shale	..	½
Total thickness	4	9

MCCURTAIN preparation plant includes washing facilities for 4 x 0 coal. Safety and management at Lone Star mines are headed by B. L. Curry, safety engineer (left); G. R. Eadie, asst. gen. supt.; and Campbell Cameron, gen. supt.

here but is diverted to a rock bin for later removal by truck to an adjacent rock-dump. A 48-in apron conveyor receives coal from the bin and delivers it to a 60-ton surge bin. From here a McNally-Pittsburg reciprocating feeder delivers it to a 36-in belt conveyor discharging to a grizzly which separates the feed into plus and minus 4-in fractions. The oversize is handpicked and the refuse is chuted directly to the refuse bin. Clean plus 4-in is loaded either as 4-in lump or joins the washed product and is loaded as R-O-M.

A McNally-Norton washer, Type 322-DD, 200-tph capacity, cleans 4x0 coal, containing 10% refuse, received from the raw-coal shaker. Washer waste is delivered to refuse elevators which deliver it to the rock bin. The washed product is dewatered on a single-deck shaking screen equipped with 1-mm-opening Wedge-Wire screens and passes to a loading chute which discharges to the railroad car.

Minus 1-mm slurry from the dewatering screens passes to a settling tank, where solids settle to the bottom and are removed by a drag conveyor and delivered to a dewatering elevator. After dewatering, the coal is delivered to a fine-coal conveyor which carries it to a point adjacent to the coarse-coal dewatering screen, where it joins the dewatered coarse product before delivery to the railroad car.

Since all of Lone Star's production goes to its coking ovens, all coal at No. 5 is loaded as R-O-M. Management has geared No. 5 production to 16,000 tons per month, which is sufficient to fill the high-volatile needs at the coke plant.

Preparation is handled at the Carbon No. 5 plant by a 6-man crew whose duties are as follows: 1 plant operator, 2 rock pickers, 1 car mover and 2 rotary dump operators.

Mining at McCurtain

The McCurtain mine, at McCurtain, Okla., also is a slope operation and, like Carbon No. 5, is classed as gaseous. An 8x20-ft rock slope, 1,100 ft long and driven 15 deg with the horizontal, provides access to the medium-volatile Hartshorne seam, which averages 57 in in thickness. Shale overlying the coal is very friable and must be supported by two 4x6-in crossbars per cut of coal with at least two additional timbers under each bar. A medium-hard fireclay underlies the Hartshorne seam and faults are frequently encountered in the mine. Present workings are 400 ft under the surface and dip 7 deg to the northwest.

Mining Equipment Lone Star Steel

CUTTING MACHINES
Jeffrey 35L
Sullivan 7B
Goodman 512
Goodman 112
Sulmet bits

DRILLS
Chicago Pneumatic 572

LOADING MACHINES
Joy 8-BU with
Long Piggyback conveyors

ROOF-BOLTING
Cleveland LeRoi S11S stopers
CP 365 impact wrenches
United Engineers dust collectors
C. F. & I. bolts

CHAIN CONVEYORS
Jeffrey 61AM

BELT CONVEYORS
Jeffrey 52B

MINE CARS
Watt 5-ton

LOCOMOTIVES
Mancha 7-ton

BATTERIES
Exide

All-belt haulage, powered by 40-hp AC motors, from the section to the slope bottom is featured at McCurtain mine. Top brushing is not required since the coal is thick enough to provide adequate clearance over the 30-in units, but grading is required where faults are encountered so that the belts can be set up with smooth vertical curves.

Mining procedure at McCurtain is similar to that at Carbon No. 5 except that crossbars set on safety jacks are used at the face in place of safety jacks alone. In entry development work, a gathering chain conveyor receives coal from entry conveyors and delivers it to the panel belt, while in room work chain conveyors load directly onto the belt. Where roof conditions permit, a Joy 8-BU loader with a Long Piggyback conveyor discharging into a chain conveyor is used to increase production in room work. Belt transfer points are sprayed with water containing Johnson-March M1 wetting agent to suppress dust.

The main haulage belt discharges to a 15-in chain conveyor that delivers coal to 5-ton steel mine cars on the sidetrack near the slope bottom. Four-car trips are handled between the loading point and the slope by a 7-ton battery locomotive and are hoisted to the surface by a Stewart cylindrical-drum hoist, powered by an 800-hp Allis-Chalmers motor. The hoist is equipped with 5,200 ft of 1⅛-in rope.

ROOF-BOLTING

Lone Star has done experimental work with roof-bolting to determine whether it could be used successfully in the extremely bad top. Wedge-type bolts 54 in long, with 8x8x⅜-in bearing plates, were installed on 3½-ft centers to supplement standard timbering in various areas in the mine and are being observed regularly to determine the value of bolting. Results thus far indicate that they have been helpful in areas where faults and slips are not present and there has been less scaling of the roof. Management plans to use bolts to supplement standard timbering in areas where Joy 8-BU loaders and bridge conveyors are used with the chain conveyors. This will permit greater mobility of equipment, faster and safer loading, and freer movement by the workers.

AC POWER SYSTEM

Purchased power is delivered to three Kuhlman 667-kva transformers that reduce it to 2,300 v for delivery underground. Each section is provided with three transformers that further reduce the voltage to 220 v. All sections are protected against grounding by ground-fault trips located at underground transformer stations.

PREPARATION AT McCURTAIN

A single-car rotary dump transfers raw coal, containing 22% reject, from mine cars to a 50-ton raw-coal bin, from which it is fed by a reciprocating feeder to a 30-in belt conveyor for delivery to the raw-coal shaker. A Stearns electro-magnetic pulley on the raw-coal belt recovers any foreign metal from the raw coal, thus protecting plant equipment and keeping extraneous material out of the clean product.

Feed from the belt is separated into plus and minus 4-in products on the raw-coal shaker. Oversize material passes to a picking table, where large rock is removed by two pickers and chuted to a refuse conveyor delivering to a rock bin, from which a truck hauls it to a disposal area. Plus 4-in coal is crushed to minus 4-in by a 24x36-in McNally-Pittsburg crusher and passed to a raw-coal conveyor for delivery to a McNally-Norton Type 422-DD 200-tph washer. Minus 4-in from the raw-coal shaker passes directly to the raw-coal conveyor and thence to the washer.

Clean coal is dewatered on a 16-ft shaking dewatering screen equipped with 1-mm Wedge-Wire screens and is conveyed to a mixing conveyor for delivery by chute to railroad cars.

Slurry from the dewatering screen flows to a settling tank, where a recovery drag conveyor removes coal from the bottom of the tank and scrapes it to a dewatering bucket elevator. After dewatering, the fine coal is carried to the mixing conveyor and is mixed with the coarse coal before being loaded into railroad cars. Clarified water from the settling tank is recirculated to the washer by a NcNally-Pittsburg 10x10 pump. Refuse from the washer is elevated to a refuse conveyor that delivers it to a rock bin, from which a truck hauls it to the rock dump.

VENTILATION

Both Lone Star mines liberate considerable quantities of methane and as a result require large quantities of air to dilute the gas to the permissible percentage. Air from Carbon No. 5 is provided by a 5-ft Jeffrey Aerodyne fan delivering 108,000 cfm at a 6.1-in water gage. Power for the fan is supplied by a 125-hp General Electric induction motor. A 6-ft Jeffrey Aerodyne fan driven by a 125-hp Fairbanks-Morse motor delivers 138,000 cfm of air at a 5.7-in water gage to McCurtain mine workings. Both fans are equipped with a 118-hp Waukesha gasoline standby engine.

SAFETY STRESSED

Adverse roof conditions in thin coal with accompanying hazards to workers prompted Lone Star Steel to integrate a well-organized aggressive safety program in their operating plans. In January, 1948, Burrell L. Curry, former federal mine inspector and production supervisor, was hired as safety engineer and assigned to the task of setting up an effective safety program at both mines. Here's how he approached the job:

The first step was to get acquainted with all supervisors and employees and learn what the problems of each were in their daily work. To get a complete picture, it was felt that all should have an opportunity to express their opinions. As a result, joint meetings between the mine safety committees and company supervisors were held to point up the problems. Meetings were informal and each group was encouraged to contribute ideas that would be helpful in setting up the program. If ideas were slow in coming, the safety engineer planted ideas indirectly so that they would be brought up later as individual suggestions. In these meetings the committeemen were sold on the merits of protective clothing, and in a short time all the men at the mines also were sold.

Next step was to prepare a group of safety rules that stressed the special hazards and the most dangerous conditions at the Lone Star properties. These were explained clearly to all employees and were enforced at all times. As a result men became safety conscious and the accident record improved. At the same time a set of timbering standards was put into effect at both mines and rigidly enforced.

Following the establishment of safety rules, a training program was developed for company employees so that ambitious workers would increase their knowledge of mining and obtain state certification. Along with this training, the safety engineer conducted first-aid training and organized mine-rescue teams. Training was conducted as a cooperative project with state mine inspectors who aided in teaching classes. Trained crews are given refresher courses in mine rescue and are required to wear the self-contained breathing apparatus every 2 mo.

To measure the results of the training program, statistical records were kept and severity and frequency rates were computed and compared with national averages. Special attention was given to preventing types of accidents that were occurring more frequently than the average for the mining industry. Several of the most significant results of the program are a 32% reduction in the number of lost-time accidents per million tons of coal produced and continuous operation since 1951 without a fatal accident.

To keep safety enthusiasm at a high level and to foster good personnel relations, Lone Star has the following continuing program:

1. Additional first-aid classes are sponsored regularly to keep men safety conscious. Class attendance is voluntary and classes are held at various convenient places so that men will not have to travel far to attend.

2. Night mining schools are conducted regularly for those who want to become certified in the State of Oklahoma.

3. Monthly safety meetings are held for all employees.

4. Semi-monthly meetings of all company officials, including mine foremen, are held to discuss operating and safety problems. Special attention is given to accidents taking place between meetings, and methods of preventing them in the future are developed.

5. Meetings of shift leaders are held the first Tuesday of each month to discuss safety problems.

6. The safety engineer takes a personal interest in all injury cases and visits hospital cases regularly. Hospital cases have become rare at Lone Star since the safety program has been in effect.

7. The company cooperates in teaching and demonstrating first aid to civic groups, thus making the neighboring communities safety minded.

8. Classes are held whenever enough men express the desire to enroll either in mining or first-aid courses.

9. Proposed additions or changes in safety rules are approved jointly by mine supervisors and the mine-safety committees before becoming a part of the company rules. This promotes cooperation in enforcement of rules.

10. Safety signs and slogans are given a prominent part in keeping the employees safety conscious and reminded of special hazards.

In addition to training its own employees, Lone Star permits employees of other companies in the area to participate in all classes without charge. Over 3,000 people in Pittsburg County have been trained in first aid since classes were established. A color motion picture taken in the mine is available to various civic groups to acquaint them with mining problems and methods. These are part of Lone Star's program in keeping good public relations by providing information and services to the community.

Helping the New Man

IT'S JUST HUMAN NATURE for a person to feel a little ill at ease when he first goes to work in a new place. If he acts a little unnatural, a little slow and confused, not quite sure of himself right at the start, it certainly doesn't necessarily mean he's slow on skill or savvy. It may mean he's a conscientious guy who is feeling his way so he can do his best on the job.

When you see a new man coming on the job in your work neighborhood, just remember you were new on the job once yourself. Remember how you felt. Give the new guy the breaks you had or would have liked to have had. Give him whatever safety help you can, even if it's just to remind him that his foreman will help him with the answers he doesn't already have.

GREEN or not, treat him WHITE.

—Bell & Zoller *Safetygram*

PRESTO! 42-inch bolts in 31-inch coal

"Invisible bolting", made practical by Kennametal Sintered Carbide Bits, is solving a difficult problem at Barnes and Tucker's Mine #20, Bakerstown, Pa. In a 31-inch seam, roof must be bolted and about twenty inches of boney removed to assure continuous working safety and provide more head room.

Bolting operation requires only a few minutes. Holes 9¼ inches in diameter are drilled through the boney with a Kennametal Hitch Bit, then bolt holes are drilled 42 inches directly into solid roof. Bolts are installed through the hitch hole with the same rig that handles the drilling. Boney is immediately timbered, and later shot down.

Perhaps Kennametal Sintered Carbide Mining Tools — and your Kennametal Representative's experience and knowledge — can solve *your* tough cutting and drilling problems. Kennametal men will be glad to help, anytime.

Holes above are 9¼-inch diameter, are drilled at rates as high as 4 feet per minute with the Kennametal HCTS Bit.

Roof bolt holes are drilled inside the hitch hole, to a depth of 42 inches. Each hole is drilled in about two minutes.

KENNAMETAL®

KENNAMETAL INC., MINING TOOL DIVISION
BEDFORD, PA.

General Offices and Main Plant at Latrobe, Pa.

World's Largest Manufacturer of Tungsten-Carbide

Drill Bits, Cutter Bits, Roof Bits, Strip Bits

Foremen's Forum

Wanted: Navigators by the Dozen

Taking a ship through dangerous passages in foul weather demands the co-operation of all hands in sighting rocks and shoals. Pulling your company through a financial squeeze requires the same co-operation among supervisors.

THE NAVIGATOR OF A SAILING VESSEL has a "picnic" in the Horse Latitudes. His craft is becalmed, which leaves him with time on his hands while he awaits the fitful puffs and zephyrs that will push him into the trade winds. Living is easy.

But it's an entirely different story in some other places—like the Straits of Magellan during a storm, for example. The sky is dark, the ill wind screams off the rocks of Tierra del Fuego, the ship's masts flail the sky and the timbers in the hull groan and creak. This is no picnic now; the navigator is on the spot. It's quite likely he'll need help. All hands aboard will be called to emergency stations to keep watch for threatening rocks and shoals and to man the pumps. If the storm worsens it may be necessary to adjust ballast or even jettison some of the precious cargo to maintain the trim of the vessel.

All this is necessary in the short run through the straits to bring the ship unscathed out into the calmer ocean. Everybody helps.

. . . IN MINING TOO

You'll find somewhat parallel situations in coal mining. Sometimes the business atmosphere is calm, and coal's net is good. Serenity reigns. On the other hand, there are times like these latter days when the sailing is anything but smooth. Many companies, having a rough time of it in this bitter experience, are forced to jettison high-cost mines temporarily. The extra burden of trying to carry them through involves too great a risk for the other mines.

Apparently, it is high time for dozens of deputy "navigators" to report to emergency stations at many of our coal mines to insure that these mines, though battered, will remain afloat like the vessel in the straits.

The deputy navigators are the foremen, of course. Their major job now is to assist the other levels of management in plotting a safe course through the sea of troubles. They can help most by sighting and reporting those methods which are dangerously wasteful of supplies, man-hours and energy.

Let's mull over these questions:

What can the foreman do to help pull his company through tight squeezes?

What will his efforts mean to himself, his company and others?

What might happen if the foreman chooses not to co-operate

DIVIDE TO CONQUER

On the question of what the foreman can do, we think his most valuable contribution will be made when he applies proven principles of supervision in a manner that will result either in fewer cost dollars per unit of production or more units of production per cost dollar. How does he do this?

Well, he divides to conquer. At present, all mining is cyclic, some methods being more cyclic than others. You can't really discover fat costs in any complex process until the process is broken down into its elements to permit close examination of these elements. Going further, the elements in the cycle may be broken down into sub-elements for microanalysis of the over-all cycle. Let's take an example.

Consider a conventional face cycle consisting of cutting, drilling, shooting, loading, timbering and intermediate transportation. A casual observer, viewing such a welter of equipment in full operation, would bet his bottom dollar that a 12c-per-ton reduction in costs would be impossible. But the beauty of this dividing-to-conquer system is that you don't have to shoot for the whole 12c. All you have to do is save 2c per ton on each of those six elements in the cycle. Wipe that smile, sir; hot supervisors do it all the time.

Furthermore, you don't have to shoot for the whole 2c in any one of the elements. Take coal-cutting costs. This figure includes bit costs, chain costs, labor, maintenance and depreciation, let's say. If you can trim 2/5 of a cent's worth of fat from the cost of each of these sub-elements, you've reached your goal with minimum strain. Now do the same for the other major elements in the cycle.

If your company's initial goal is a reduction of 24c per ton rather than 12c, don't be alarmed. You can find that much, penny by penny, through close scrutiny of the sub-elements making up your cycle. There is a limit, but some companies have been pleasantly surprised in what they have been able to do with a supposedly tight cost structure.

That's the gist of the divide-to-conquer system for controlling costs.

SPOILS FOR THE VICTOR

Having achieved his cost goal, the foreman can look with becoming pride at his contribution. In a difficult period he has helped in turning aside a threat to his company's very existence. And what does that mean?

It means he has insured his own job and that's a major item in the credit column.

He has protected the jobs of all his employees. That may mean more and more as time goes on since the more stable companies can expect to wind up with the best workers on their payrolls.

Most coal operators enter the business

Quotable Quotes

"Woman is the last thing which will be civilized by man."

—George Meredith

"We do not need more national development, we need more spiritual development. We do not need more intellectual power, we need more spiritual power. We do not need more knowledge, we need more character. We do not need more law, we need more religion. We do not need more of the things that are seen, we need more of the things that are unseen."

—Calvin Coolidge

Underwater operation holds no peril for these Hazacord cables. Skid mounted junction box contains four 400 amp. circuit breakers . . . single cable leads from transformer bank; four branch circuits go to the control house near the shovel (below). The 500 horsepower motor which operates the pit-pump used for pumping the phosphate-bearing matrix to the washer also gets its power through Hazacords.

Grabbing 17 yards of phosphate rock in a single bite, this enormous dragline supplies raw material for fertilizers and chemicals produced by the Virginia-Carolina Chemical Corporation. Power is furnished by thousands of feet of Type SH-D, 5000-volt Hazacord cable.

Hazard's exclusive ZBF sheath—cured under pressure in a continuous metal mold—is one reason why Hazacord cable can take the rough treatment it gets being dragged over this rugged Florida terrain.

VC CHEMICALS SELECTS LONG-LIVED HAZACORD SHOVEL CABLES FOR RUGGED SURFACE MINING OPERATION

Safest and most widely used high-voltage shovel cable in the mining field, Hazacord Type SH-D has an outstanding record of service for all types of all-weather, open-pit operation. Copper shielding braid over each insulated conductor provides extra strength as well as safety . . . grounding conductors in the interstices provide a safer, more dependable grounding circuit . . . Hazacord Type SH-D is available for operating ranges between 2001 and 15,000 volts.

On *every* job . . . from a giant dragline to a portable electric saw, Hazacords are setting new standards for long, economical service from cords and cables. Get complete information from your Hazard representative, your jobber or write to us today. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

1403-A

HAZACORD Mold-Cured portable cables

"Help Safety," Glen Alden Asks Women

A DIRECT, SINCERE APPEAL to those most affected by mine accidents is the keynote of this letter sent by the Glen Alden Coal Co. to the some 8,000 women related to its mine force. Avoiding all generalities, the letter makes specific suggestions as to how the women of mine families can help and emphasizes the importance of their interest. In discussing this approach, Francis O. Case, Glen Alden president, says: "There has been quite a bit of reaction to the letter, both in mail and in personal comments. Of course, at this writing, it is too soon to learn what results will be obtained, but this course will be pursued further as a part of a concerted effort by all members of management to reduce accidents. This method of approach—appealing to the wives and mothers of our workers—is one that I have used before, particularly during the war," Mr. Case points out. "Combined with other methods, it has been extremely effective in the past; I sincerely hope it will be here."

GLEN ALDEN COAL COMPANY

18 SOUTH RIVER STREET
WILKES-BARRE, PA.

OFFICE OF THE PRESIDENT

July 24, 1953

Dear Madam:

Since taking office as President of Glen Alden on March 1, I have been deeply disturbed by the accidents that have happened in our mines. I hope you and all the other women of families whose men work in the mines of Glen Alden Coal Company will help me on this problem.

Safety in anthracite mining is a subject to which we at Glen Alden give much thought and study. Personally, I believe that mine accidents can be eliminated. Many, if not all of them, are the result of men being careless at times. There are certain things which men working underground should not or must not do. Then there are other things which they should or must do. There are safety rules which cover these "do's" and "don'ts."

I am sure that men working in our mines know these safety rules. I am sure that if these rules are followed the problem of mine accidents would be beaten.

Here are a few suggestions of how the women of mine families can help:

Won't you remind your man every day he leaves home for his job at the mines to be careful—to observe all safety rules? Help him to remember that ignoring even a single rule invites an accident.

Won't you try to arrange family parties or celebrations on those nights not followed by work days? When a man hasn't had sufficient rest he is apt to be careless at his work. Many accidents happen just that way.

Won't you insist that your man stay home when he isn't feeling well? Any man who has his mind on how badly he feels is likely to ignore safety rules.

Won't you avoid asking your man to hurry home? Hurrying on the job is one of the most common causes of accidents.

Won't you talk with your man about this important subject on safety in mining? Won't you ask him to tell you about all the "do" and "don't" rules and why all these rules have been adopted?

I am sure if we, you and the men work together on safety that mine accidents can be a thing of the past. I feel very sure of your interest and I want you to know that your help can be very important. It will be appreciated, I assure you.

Sincerely,

Francis O. Case

Francis O. Case
President

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with a resolve to stay with it permanently. It seems to us a fellow could derive a lot of satisfaction from knowing he had helped escort his outfit through a deep and narrow labyrinth.

To make this contribution, good foremen constantly apply the divide-and-conquer system, as mentioned. They work hard at keeping their crews on the approved cycle, since they know that deviations from the cycle are cumulative errors—meaning, they add up to a frightful waste of man and machine hours, they don't cancel each other. Good foremen also know where to spend their energy wisely, not in watching the loading machine in fascination but in keeping face preparation attuned to the timetable.

Of course you will be expected to do all this with one hand, so to speak, while the other hand is busy increasing safety, preventing waste of materials, handling complaints and doing the host of other duties which falls to the lot of a mine supervisor. It's a big job, one that separates the men from the boys.

DEVIL TAKES THE HINDMOST

What about the foreman who for some reason or other decides this is someone else's problem? He says: Section or mine costs are as low as it is humanly possible to make them.

Now hear this . . . you're courting disaster. When a coal man talks about free enterprise he really means it. There are no automatic subsidies to take up the slack, and life in the coal business consists of making constant adjustments to the law of supply and demand. Hard economics rules. Although there still is a big market for coal, it will have to be satisfied by efficient mines only, since the margin between production costs and selling price is so narrow.

Let's not dodge the facts of life. In the recent past, a number of mines have been taken out of production (shut down, in blunt terms) because they could not meet the challenge inherent in existing conditions.

This is one race in which you must run fast, not in the hope of taking a big winner's purse, but in the knowledge that the devil takes the hindmost. The devil's hot breath brushes all supervisors who think of the emphasis on cost control as only so much talk.

JENKINS PRACTICAL PIPING LAYOUTS 65

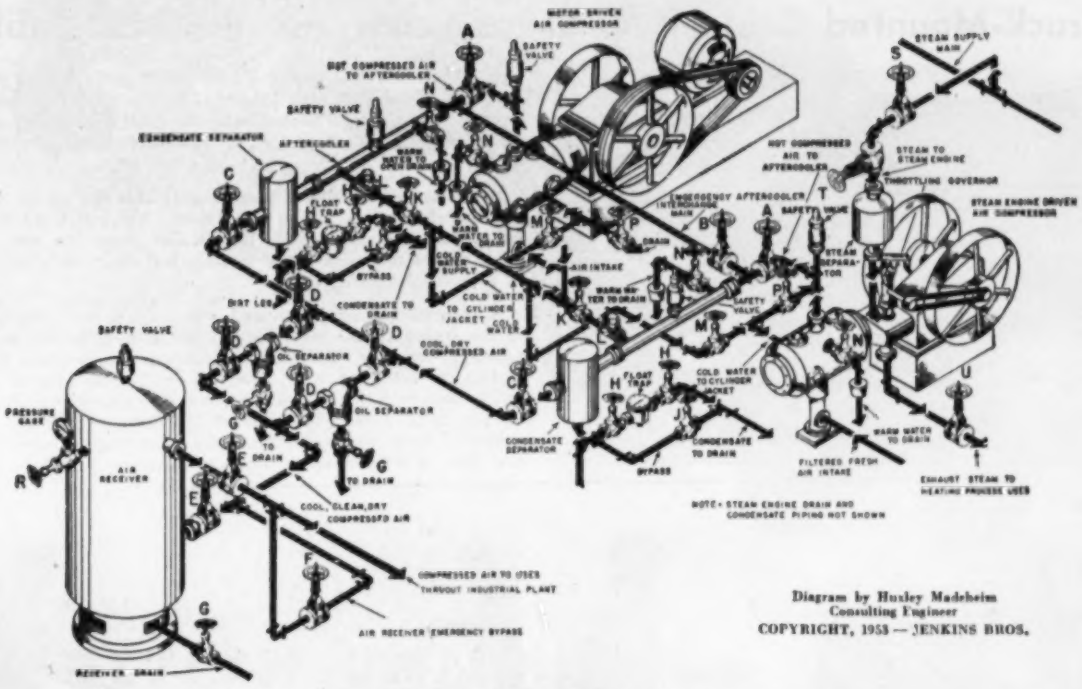

Diagram by Huxley Madeheim
Consulting Engineer
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VALVE RECOMMENDATIONS
Send for details of Jenkins Valves to suit varying conditions.

Code	Quan.	Jenkins Valves	Service
A	2	Fig. 651-A I.B.B.M. Gate	Compressor Discharge Shutoff
B	1	Fig. 651-A I.B.B.M. Gate	Emergency Changeover Line
C	2	Fig. 651-A I.B.B.M. Gate	After Cooler Shutoff
D	4	Fig. 651-A I.B.B.M. Gate	Oil Separator Shutoff
E	2	Fig. 651-A I.B.B.M. Gate	Air Receiver Shutoff
F	1	Fig. 651-A I.B.B.M. Gate	Air Receiver Shutoff
G	3	Fig. 106-A Bronze Globe	Drain Line
H	4	Fig. 950 Bronze Globe	Trap Shutoff
J	2	Fig. 950 Bronze Globe	Trap By Pass
K	2	Fig. 106-A Bronze Globe	Cold Water Control
L	2	Fig. 352 Swing Check	Prevent Backflow
M	2	Fig. 106-A Bronze Globe	Cold Water Control
N	4	Fig. 106-A Bronze Globe	Drain Shutoff
P	2	Fig. 106-A Bronze Globe	Drain Shutoff
R	1	Fig. 744-G Needle Angle	Pressure Gage Control
S	1	Fig. 204 I.B.B.M. Gate	Steam Supply Line
T	1	Fig. 923 I.B.B.M. Globe	Steam Engine Shutoff
U	1	Fig. 651-A I.B.B.M. Gate	Engine Exhaust Shutoff

How to plan PIPING CONNECTIONS FOR AN INDUSTRIAL PLANT AIR COMPRESSOR

Compressed air is more economically supplied from a central installation in plants where demand is extensive. In such a system, the highest single pressure requirement in the plant determines the number of compression stages needed, and local pressure reducing stations meet the requirements of specific operations.

A single stage system is shown in this layout. Equipped with electric and steam driven compressors, this installation can develop 125 p.s.i. The former usually serves as a stand-by unit, but both can be used jointly for heavy load conditions.

The compressed air, after leaving the compressors, passes through a water-cooled after-cooler, which lowers air temperature and condenses moisture. The air then goes through oil separators and on into the air receiver, which decreases pressure pulsations and serves as a storage reservoir.

A capacity reduction device helps control load fluctuations in the constant-speed electrically driven compressor. In variable speed steam driven compressors, the throttling governor responds to load changes.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installation.

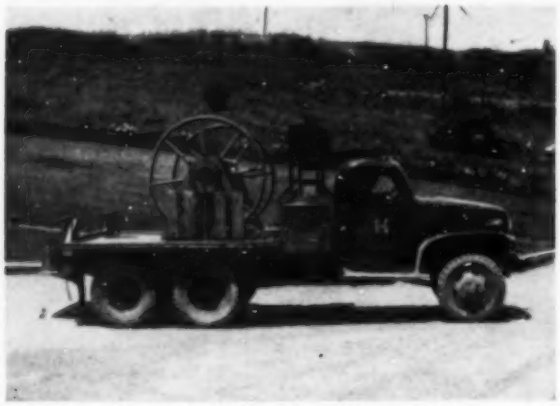
To save time, to simplify planning, to get all the advantages of Jenkins specialized valve engineering experience, select all the valves you need from the complete Jenkins line. It's your best assurance of lowest cost in the long run. Jenkins Bros., 100 Park Ave., New York 17.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information. Simply ask for Piping Layout No. 65.

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864
JENKINS MARK
Jenkins Bros.

Operating Ideas

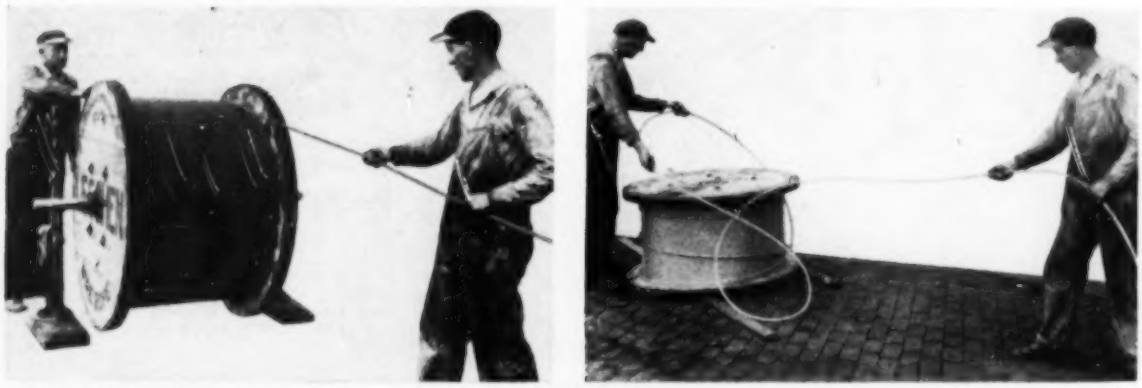
Truck-Mounted Cable Reel Saves Labor and Protects Cable



HANDLING UP TO 10,000 FT of power cable in one shift with a two-man crew and longer cable life are chief benefits derived from a truck-mounted hydraulic cable reel used at strip mines of the Hanna Coal Co., division of Pittsburgh Consolidation Coal Co.

A two-man crew does the same work that five or six men formerly did with the aid of a bulldozer. Not only is the work done easier and faster with the smaller crew, but also the cable can be moved to a new location and made ready for use in a much shorter time.

A conventional oil pump used with a truck hydraulic hoist is the source of oil pressure that drives a hydraulic motor powering the unit. Direction of rotation is controlled by a system of valves. A wide roller mounted at the rear of and nearly flush with the truck bed protects the cable as it is wound on the reel. Cables have longer life because they are not subjected to as much abrasive action or cutting as previously and there is little or no twisting or kinking.



THE RIGHT WAY (left) and the wrong way of taking wire rope from a reel. Improper handling may cause kinking, with distortion of the strands, excess wear or permanent damage to the rope resulting.

How to Handle and Install Wire Rope Properly

By WALTER C. RICHARDS, Chief Engineer
A. Leschen & Sons Rope Co.

FOR THE BEST RESULTS from your wire rope, correct handling before its use and careful installation are essential. Improper handling may permanently damage wire rope even before it is put into service. Though without moving parts, wire rope is often referred to as a "machine," and it should be treated accordingly. Here are eight major points:

1. UNLOADING

Wire rope arrives on the job either in a coil or wound on a reel, in a railroad car or truck. When unloading, do not drop the reel onto the ground or platform. The heavy rope might shift its position or, from its inertia alone, cause the reel to collapse. The rope might be damaged as a result, or it could be damaged in the difficult operation of removing it from a collapsed reel. If in a coil, the rope might be bent enough to give it a permanent set. Do not roll reels or coils over very stony ground, since the weight may cause sharp rocks to indent the rope. A bar used to roll a reel will do the same thing if it bears against the rope so use the bar against the flange instead.

2. STORING

Reels and coils generally are stored for a time before installation and they should be placed under cover if possible, or at least kept clean and dry and protected from the weather. Do not keep rope in a place that can be reached by acid fumes or other corrosive agents. If the rope is to remain in storage for some time, it is advisable to cover it with waterproof paper. On arrival, wire rope is frequently factory-covered with a "protector" that will preserve it for a long time. Otherwise, the outer layer should be covered with a good rope lubricant.

If used rope is put into storage, the same precautions should be taken to protect it from corrosion. In addition, it should be thoroughly cleaned, given a

ACTION UNLIMITED—

THANKS TO BATTERY POWER!

Battery-powered shuttle cars *go anywhere.* They run around obstructions, travel alternate routes to and from the loader . . . travel unusual distances. They eliminate passing problems, speed up production and give unequalled SAFETY. For mine shuttle cars, there is *no* power like Gould Battery power.

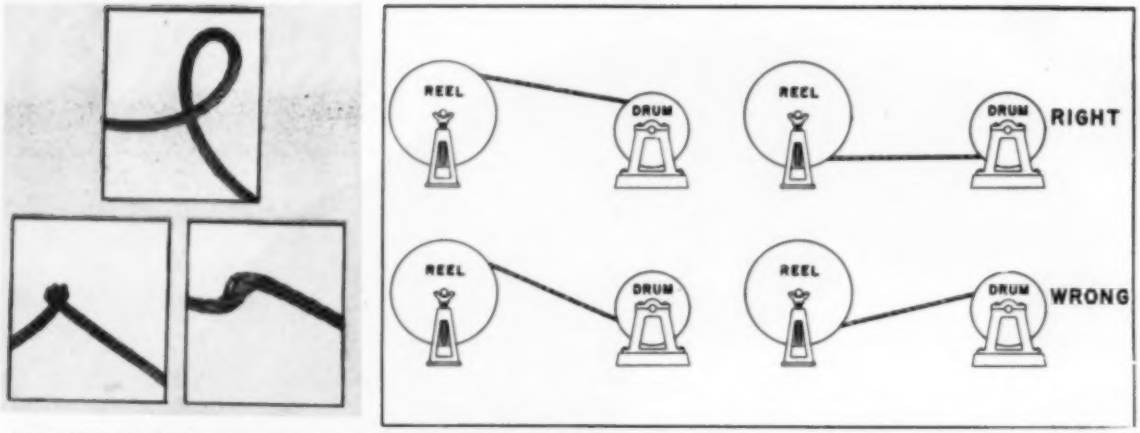
Specify
THE GOULD "THIRTY"—
America's Finest
Mine Shuttle Car Battery

GOULD INDUSTRIAL BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

©1953 Gould-National Batteries, Inc.



KINKING STARTS when wire rope loops (top left) and tightening of loop distorts strands. Even if wires are not badly damaged, the rope is out of shape and its service will be affected. At right, the correct and incorrect ways of winding a rope from a reel to a drum.

coating of lubricant and wound on a reel. Do not coil it loosely on the ground or floor nor pile heavy pieces of equipment on top of it.

3. KINKS AND KINKING

Careful handling in installing wire rope will prevent kinks, which are almost impossible to remove and result in permanent damage to the rope. If a loop forms in slack rope, it should be thrown out at once because a kink will develop if the loop is drawn tight. The strands are distorted and become permanently set in this position, with excess wear and fracture of wires resulting at this point. Even if the wires are not badly damaged, the rope is out of shape—which will mean excess wear on the displaced strands.

4. UNREELING AND UNCOILING

There is always danger of kinking a wire rope if it is improperly unreeled or uncoiled. A reel should be mounted on jacks or a turntable so it will revolve as the rope is pulled off. Sufficient tension should be applied to keep slack from accumulating, by use of a board acting as a brake against the reel flange. Or, the end of the rope may be held by a workman and the reel rolled along the ground.

When transferring rope from one reel to another, be sure that the rope is taken from the top of the full reel and wound over the top of the empty reel, or from the bottom of one reel to the underside of the second reel. Reverse bends are thus avoided.

5. INSPECTION OF EQUIPMENT

Before installation, carefully examine the drums and sheaves on which the rope is to be used. A new rope cannot be expected to give good service if the sheaves or drum are badly worn or damaged. A sheave out of round or with worn bearings will not run true and will damage the rope. Make sure the grooves are smooth and of full diameter. A sheave with a corrugated or pinching groove should be turned out or replaced.

6. INSTALLING

It is a good practice to wind the rope directly from the reel to the drum, being careful to see that the bends are made in the same direction as when transferring rope from one reel to another. Mount the reel with the axle parallel to the drum and keep it under tension to avoid accumulation of slack. On a smooth-faced drum apply a little more tension and keep the wraps close together without crowding. A right-lay rope spools best if wound from left to right over the top of the drum when viewed from the side opposite to that from which the rope is leading onto the drum. If underwound, the rope should lead from right to left.

7. BREAKING IN

It is very important, when starting to operate a moving rope, to run the machine for a while with no load, and for another period with a light load, to permit the wires and strands to adjust themselves. This way, the rope will have "set" itself to the working conditions, and when full operation is reached it will operate more safely and efficiently. The time spent in breaking in a wire rope will be more than regained by the extra service obtained.

8. WORKING LOAD

The ratio of the rated breaking strength to the normal working load is called the safety, or design, factor. In selecting the proper rope to use on any installation, it is necessary to employ an appropriate design factor. The estimated design factor should be greater if a careful calculation of all the forces acting upon the rope is not made.

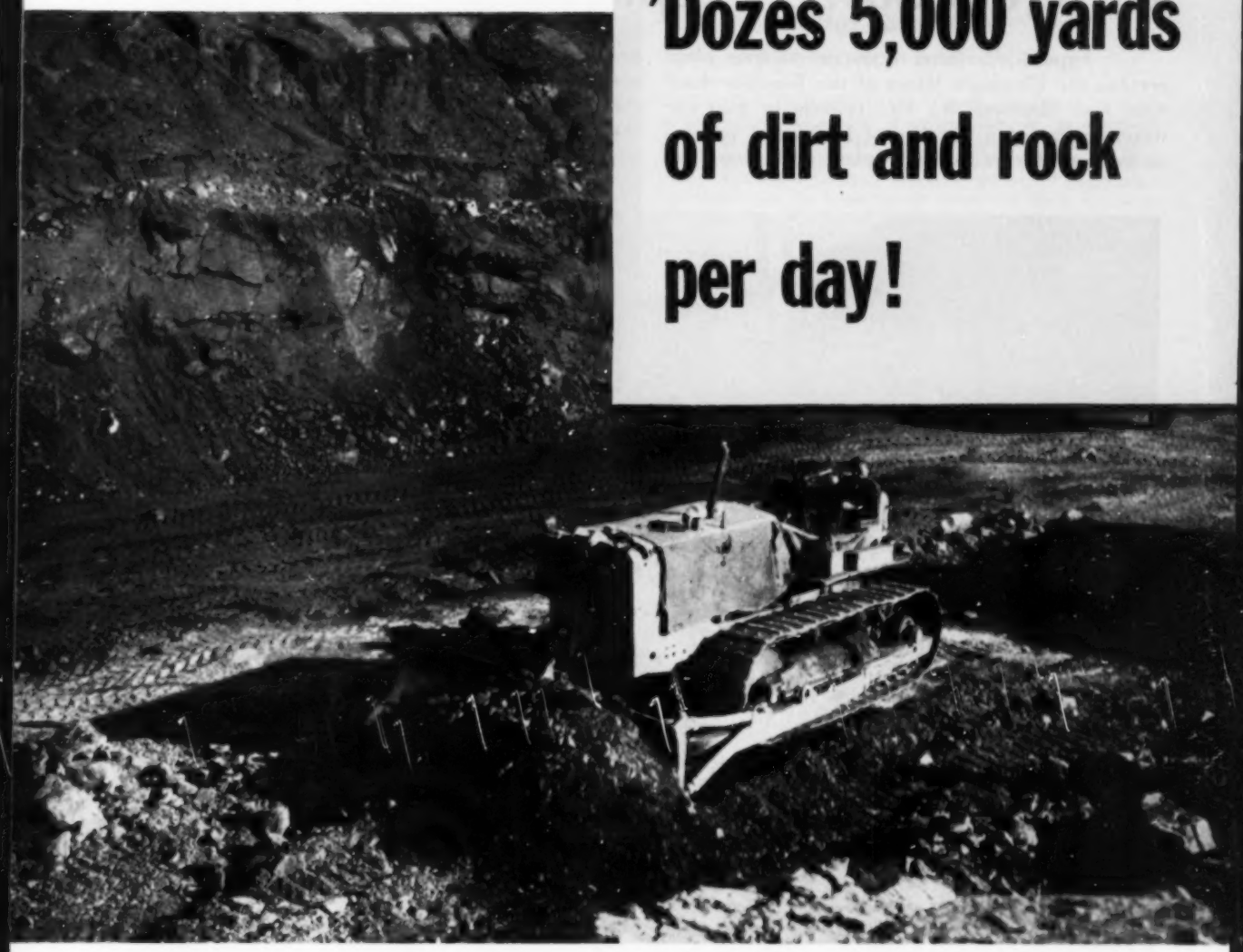
It is impossible to set a figure to be used in all cases as operating conditions are never the same. Such a great variation exists that design factors may range from 3½ to 10. For estimating work of a general nature, a factor of 5 or 6 frequently is used.

The factors influencing the selection of the proper rope for a specific application include: the dead load, speed, acceleration and deceleration, length and weight of rope, diameter, number and arrangement of sheaves, size of drum and fittings used. Also the effect of abrasion and corrosion and the danger to life and property if the rope should fail should be considered.

How Are You on Cost Cutting?

AS EMPHASIZED in *Coal Age's* current series of Special Reports, effective cost cutting involves attention to every single step in the production cycle, auxiliary mine services, planning and methods—with the "little" everyday operating problems studied just as closely as changes in major equipment and methods. Anything that trims your cost per ton, saves on material or equipment, cuts labor on one operation for use in another, improves output per man by only a fraction, is a practical cost cutter *Coal Age* would like to tell others about. Just write us a letter in your own words, with a rough drawing or photo if needed. Tell us how your idea works and what it accomplishes, and we'll do any editing necessary. *Coal Age* will gladly pay you $10 or more on publication of each item. Address: The Editor, *Coal Age*, 330 West 42d St., New York 36, N. Y.

'Dozes 5,000 yards of dirt and rock per day!



This Cat* No. 8A Bulldozer with No. 25 Cable Control logged 11,090 working hours in 30 months for Luscar Mines, Ltd., Luscar, Alberta, Canada. Cleaning rocky material out of the pit in a strip mine, it handles about 5,000 yards per day. Mine Manager D. Hamilton says: "We get very satisfactory service from our D8s. Compared to the power formerly used, we have a minimum of down time."

Again and again, from other men in the field, you'll hear that Caterpillar Bulldozers whip competitive units on working time and over-all production. There's good reason. These big yellow brutes are built to stay on the job day after day under conditions that lick ordinary machines. Tractor horsepower and blade capacity are matched for top performance. Scientific curving of the moldboard permits big, rolling, fast-moving loads. Specially treated steels add life both to the blade and cutting edge. Blades are easily adjusted and quickly detached. And your Caterpillar Dealer is nearby to give fast service from a stock of genuine parts—*when* you need it, *where* you need it!

No other manufacturer offers as complete a line of 'dozers as Caterpillar. There's one to meet *any* requirement you have. Ask your dealer to demonstrate what a Cat can do on your job—the tougher the better!

Caterpillar Tractor Co., Peoria, Illinois.

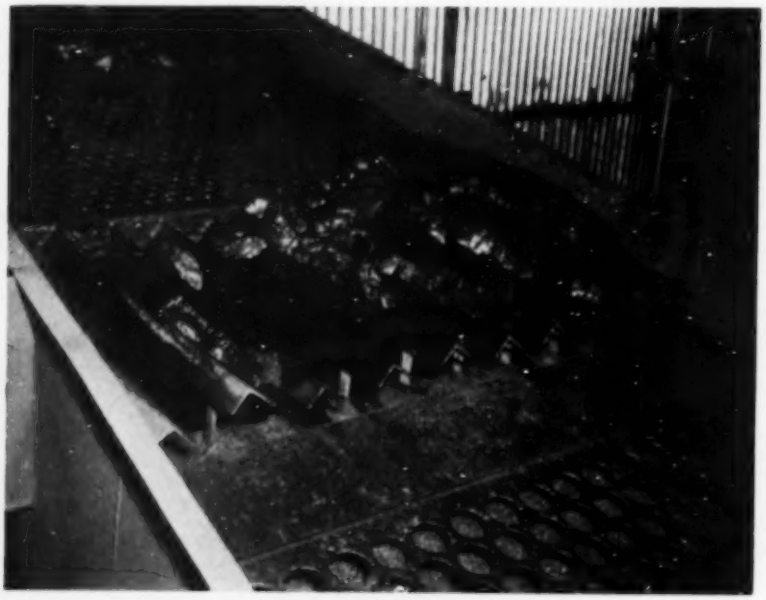
CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Gadgets Solve Preparation Problems

Smooth operation of the preparation plant serving the Hampton Mines of the Westmoreland Coal Co., Madison, W. Va., reflects in part the development of a number of kinks and gadgets to solve problems found in plant operation. The problems ranged from screen blinding to getting accurate samples of fine coal during loading. How they were solved by developments originated on the job is the subject of the five Operating Ideas which follow.



Angle Iron Grizzly Removes Flats

TO REMOVE FLATS and improve the appearance of washed lump and egg, H. M. Gilpin, chief coal inspector and laboratory technician, Hampton Mines, Westmoreland Coal Co., Madison, W. Va., devised for the dewatering and sizing shaker a screen section composed of angle irons mounted so that flats drop through and the more cubical pieces ride over.

As indicated by the photograph, the angle irons are mounted as a grizzly of inverted Vs. By experiments with the first design the best size of angle iron, and spacing and pitch, were determined.

The flats are from a thin splint band which is not high in ash but does not look good on a car of washed coal. This splint is crushed and goes to nut-slack.

ANGLES HAVE LESS PITCH than the screen, thus providing more time to tip the flats and drop them through the slots.

Swinging Trough Cuts Good Sample

REPRESENTATIVE SAMPLES of fine coals at Hampton Mines, Westmoreland Coal Co., Madison, W. Va., are secured at the railroad car by a trough which an operator swings at considerable speed through the stream coming from the loading boom. The trough rests in a rack on a horizontal jib or boom pivoted on a structural column between loading tracks. To empty the trough into the container, the operator slides the trough in toward the column and then raises the outer end until the coal slides out.

The standard, or shaft, to which the boom and guy are attached resembles the rear axle of a car but is a straight tube without differential. The boom is welded to the hub of one wheel and the guy to the other. In a few minutes time the whole device can be shifted to serve the adjacent track. The base plates welded to the column have slots and holes to accommodate the change. Results compared to other methods of hand sampling have been excellent.

SWING SPEED OF TROUGH is practically the same each time because the operator is instructed to give it sufficient start so that when he lets go it will swing on around to his platform.

NOTCH ADJUSTMENT of the leading vane is seldom changed but the operator frequently raises and lowers the plow.

Plow Improves Appearance and Mixing

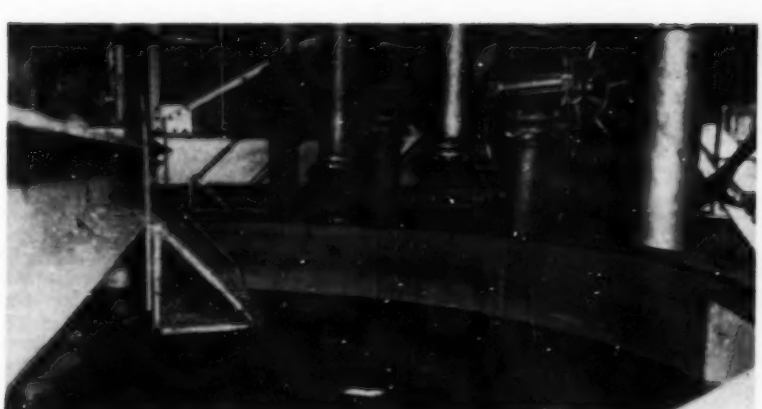
TO LOAD NUT-SLACK COAL of good appearance from top to bottom, as well as coal of uniform mixture, an adjustable plow was added to the end of the nut-slack boom at Hampton Mines, Westmoreland Coal Co., Madison, W. Va . The problem was to distribute the ¼ x 0 deposited on top of the washed nut already on the boom evenly across the boom discharge. Plow elevation is adjusted frequently to suit the load on the boom by means of a wire rope extending to the adjacent tipple control house. A vane at the front end of the plow is adjustable as to angle for any off-center carrying of the ¼ x 0.

Loose Screen Plates Prevent Clogging

PROVIDING A SMALL AMOUNT of play in screen plates eliminated a clogging problem which had cost the labor of one man in the preparation plant for Hampton Mines, Westmoreland Coal Co., Madison, W. Va. Because of the shape and hardness characteristics of the coal, the 5-in holes at the lower end of the dewatering and sizing shaker plugged so badly that a man was stationed at the screen to keep the holes open.

The solution was arrived at by accident. When a screen plate was changed it was not properly fastened. As a result, the holes did not blind as much as usual. Now it is the regular practice to mount the two 5-in-hole plates so that they slide about 1 in in the frame at the end of each stroke.

THE 1-IN CRACK ALONG LEFT SIDE of foreground section permits that much screen-plate movement.



BASKET for catching tramp wood shows at the left between shifts when the water level is down in the cone.

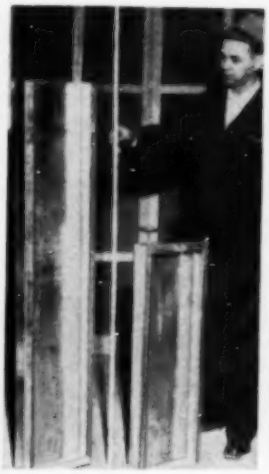
Tramp Wood Removed By Basket In Cone

IN A PREPARATION PLANT where there is no hand picking there is the problem of removing wedges and other pieces of wood from the coal. At Hampton Mines, Westmoreland Coal Co., Madison, W. Va., a Bradford breaker which reduces the coal to 8-in removes large pieces of wood but passes many wedges and even a few half headers. These are caught by a basket in the 13½-ft Chance cone.

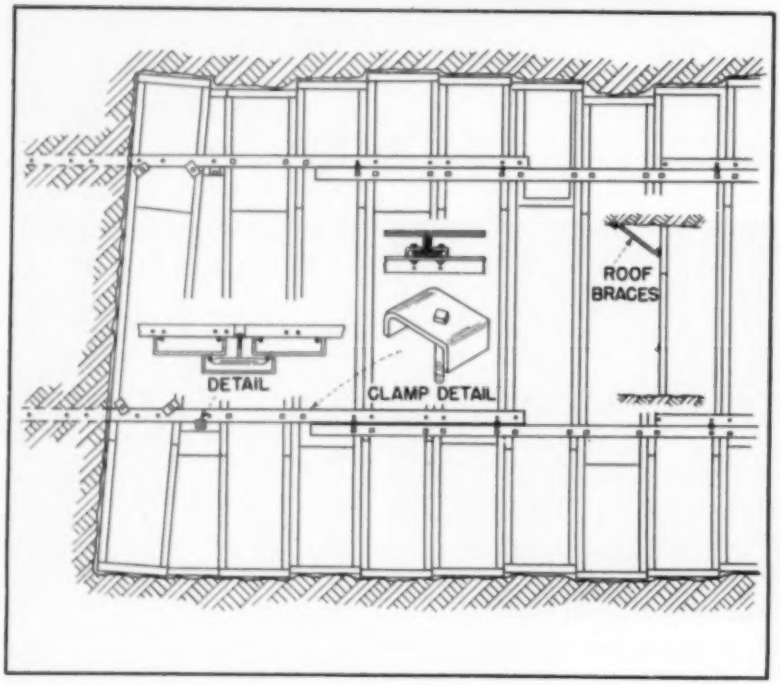
The basket is installed in a fixed position with the screen-wire bottom 6 in below the surface of the water. Circulation in the cone lands the wood in the basket. The operator removes the accumulation at the end of the shift or, if necessary, during the shift.

Equipment News

HOW TO ORDER . . . more information on the new products and the free literature described in this section. As you check over the 83 items on these Equipment News pages (through p 130), note the numbers of the items that interest you. Circle the numbers on the postage-free card facing p 128, sign and mail the card. That's all there is to it. Coal Age will inform the manufacturers and they will gladly send the material you wish, without obligation.



Steel Stoppings Quickly Installed and Reclaimed (1)



Quick installation, airtightness and easy reclamation for use again are major features cited by the builders for the new Tri County prefabricated steel stoppings shown in the accompanying illustrations (patents pending). The stoppings consist of prefabricated sheet-steel sections with the necessary angles, braces, clamps, etc. With these sections and parts, the stoppings are erected by the regular mine force where needed. When they are no longer needed, they are dismounted and moved to a new location.

The steel sections are 1 ft wide and are made in 3- and 5-ft lengths. The sections telescope into each other, making it possible, for example, for the 3-ft sections to fit openings from 3 to 6 ft high. For width, as many 1-ft-wide sections are used as necessary, and special clamps permit overlapping at the sides, as shown, to compensate for slanting ribs. After assembly, the openings between sections and around the roof, floor and ribs are closed with ordinary caulking compound applied with a gun.

Both Illinois state inspectors and U. S. Bureau of Mines representatives have approved the stoppings, the builders point out, and a sizable number already are in service. High resistance to shooting shocks are among the features of the stoppings. Similar equipment is being developed for overcasts. Circle No. 1 on the postage-free card facing p 128 for more details from The Tri County Building Service, Taylorville, Ill.

from start to finish —a fast cycle!

Permissible RBD-30 Mobile Roof Bolting Unit
U. S. Bureau of Mines Approval Plates:
A-879-250 Volt DC
A-879A-500 Volt DC

That's right – with a CP Permissible RBD-30 Mobile Roof Bolting Unit you can complete an entire bolting cycle easier and faster. Under average conditions you can drill hole and set expansion bolt without repositioning in only 3 minutes, and in some cases where hole depth is less than 36" installation is made in 1½ minutes.

Both auger and bolt-setter are driven by the same motor – a telescopic chuck has 10-inch auger adjustment to conform to roof irregularities. Designed to operate at a fast pace in seams as low as 30 inches the RBD-30 is equally efficient in high seams. Slip clutches prevent feed motor from stalling – protect drill and bolt setting motor. *Chicago Pneumatic Tool Co., 8 East 44th Street, New York 17, N. Y.*

Chicago Pneumatic

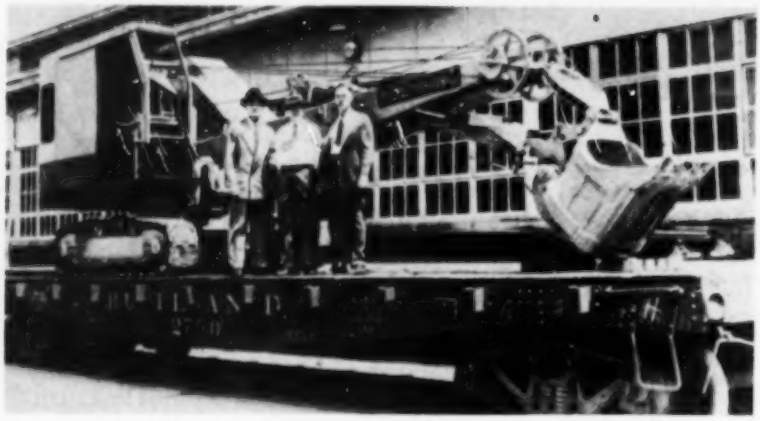
PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

HIGH-SPEED SURFACE SHUTTLE CAR (2)

Equipped with 4-wheel steering and 4-wheel drive, this shuttle car manufactured by Getman Bro., South Haven, Mich., has a hydraulically operated dump box measuring 70 x 84 x 12 in and a capacity of 1¾ yd, or 2 tons. The dump box also is available in other dimensions to meet specific conditions. The car is equipped with a Continental HD-260 engine featuring a heavy duty oil-bath air cleaner, 35-amp generator and a transmission providing four speeds forward and reverse from 1 to 20 mph. Over-all dimensions of the unit are 6 ft 4 in wide, 16 ft 6 in long and 5 ft 9 in high. More details from the maker.

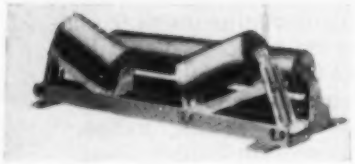
RUBBER-TIRED BULLDOZER (3)

Now in experimental service, the new Euclid Model TPM bulldozer, or "prime mover," is powered by a 300-hp engine. Working under extremely wet condition, the company reports, the unit is loading various makes of scrapers heavier than average in less time—for example, 15½-yd scrapers to 18.1 cu yd. The unit is an all-wheel-steer, all-wheel-drive tractor mounted on 24:00 x 25 tires and weighs 48,000 lb equipped with blank-foot bulldozer blade.—Euclid Road Machinery Co., Cleveland 17.



CRAWLER EXCAVATOR (4)

Rated at ¼ cu yd, shovel or hoe capacity, a new Koehring crawler-mounted excavator with a 29% increase in lift-crane capacity is now being manufactured with a simplified upper machinery arrangement that involves only two horizontal shafts. Crane capacity of the redesigned Model 205 unit is now 10 tons, against 7¾ tons previously, and the unit also may be used as a dragline or clamshell, with choice of diesel, gasoline or electric power. Other improvements cited by the company include fully enclosed gears, automatic brakes, new cab design and operating-lever arrangement, adjustable hook rollers and electric dipper trip.—Koehring Co., Milwaukee 16, Wis.

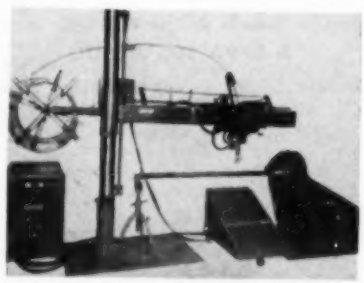


VARIABLE-TROUGHING IDLER (5)

A new variable troughing belt-conveyor idler for smooth transition between troughing idlers and flat pulleys is designed to permit adjustment of the angle of inclination of the concentrator rolls from 20 deg to fully horizontal, thus minimizing stresses and increasing belt life. Although designed with certain thicker and costlier belts, such as the steel cord, in mind, the idlers are described as being helpful in many types of installations. The idler is available in two types: Series 100, 24- to 60-in belt widths, all belts carrying all but the heaviest and coarsest materials; Series 200, 36- to 72-in belts, heaviest and coarsest materials. Full details in new 48-p Idler Book No. 2416 from Link-Belt Co., 307 N. Michigan Ave., Chicago 1.

AUTOMATIC WELDER (6)

New Model 650 Leader automatic welding machine of the heavy-duty type, according to the builder, features consolidated fingertip control; dual adjustable spring-braked rod-reel holders; 20:1-ratio 8-ft cross arm; motorized pedestal with 6-ft pushbutton-controlled lift which can be rotated 360 deg; heavy-duty automatic welding head with contact tips, extensions and adjustable rod-



"$280.00 A DAY IN RECOVERABLE COAL WAS SLIPPING THROUGH MY FINGERS INTO THE REJECT"

It is difficult to distinguish coal from refuse at the washer level. Many wash-box operators do not detect this hour-to-hour loss. Dollars are lost in the refuse bank instead of being deposited in the bank account. Frequently we call this loss to the attention of operators. One smart operator suspected that recoverable coal was slipping through his fingers and, as he said to us . . .

"I DECIDED TO DO SOMETHING ABOUT IT BY...

Talking it over with

McNALLY PITTSBURG

The Men Who Know Coal From The Ground Up

I TOOK THE FIRST STEP BY MAILING THIS CARD"

FIRST CLASS
PERMIT No. 93
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PITTSBURG, KANSAS

This McNALLY Combination INTO

THE McNALLY WASHERY

The washery illustrated here is typical of the more than 240 McNally modern coal preparation plants now in operation. This one is equipped with the latest in crushing, screening, conveying, washing, and dewatering equipment to capture even the fines from the slurry. It was designed to up-grade the particular raw coal feed of that seam. But that's not all . . . it benefits by the continuing McNally Pittsburg engineering and field adjustment service to prevent loss of recoverable coal.

If Your Rejects Are Full of Recoverable Coal

Talk it over with **McNALLY PITTSBURG**

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

We would like to have the McNally Pittsburg Service Engineer in our area call on us immediately to check the following:

( ) Efficiency in wash boxes
( ) Unusual wear
( ) Excess moisture in washed coal
( ) Excess fines in crushed resultants
( ) General plant efficiency

Name _____ **Title** _____

Company _____

City _____ **State** _____

DEPOSIT THE MONEY IN YOUR BANK ACCOUNT INSTEAD OF IN YOUR REJECT BANK

Mail The Card Now

McNally Pittsburg Mfg. Corp.
General Offices: Pittsburg, Kansas

turns unrecoverable loss PROFIT

What appears to be an insignificant amount of coal slipping into the refuse bank can amount to a sizeable sum in recoverable coal every day. For instance, a washery operating at 500 TPH may lose 10 TPH without being noticed. That's 70 tons per day through the inefficient setting of a washer, or an inefficient washery system. At an arbitrary market figure of $4.00 a ton, that's $280.00 a day. That loss is unrecoverable when it gets into the refuse bank . . . but it can be prevented. And we are here to help you capture that saleable coal.

..PLUS THE EXCLUSIVE McNALLY *Field Adjustment Service* RIGHT IN YOUR PLANT THAT PREVENTS AVOIDABLE COAL LOSS TO REFUSE

Sometimes the characteristics of your raw coal change without being immediately detected. A trifling change in your raw coal feed, such as specific gravity distribution, changes in ash relationship, size consist, fracture, or other physical characteristics, will require manual changes in the washer adjustment.

Sometimes it's combinations like this that baffle the washer operator. It's how to detect them quickly and adjust for them that makes McNally field adjustment service so valuable.

HERE ARE THE MEN WHO PERFORM THIS SERVICE

They are strategically located to make periodic field adjustment service calls. They are apt to call at a McNally-built plant unannounced. And, of course, they are always as close to all coal operators as the telephone for emergency service. In addition, staff men are available from our main plant and executive offices in Pittsburg, Kansas, our subsidiary at Wellston, Ohio, or from our sales and service offices in Chicago, Illinois, and Pittsburgh, Pennsylvania.

One thing you, as a customer of ours, will never get from us is a bill for service to keep our equipment operating at the peak of efficiency for you.

TERRE HAUTE, IND.
Jerome V. "Jerry" Lentz
115 N. Fruitridge Ave.
Telephone: Lincoln 2779

WASHINGTON, PA.
R. E. "Dick" Ivey
1028 Michigan Ave.
Telephone: 3089-R

PINCKNEYVILLE, ILL.
Wesley Smith
P. O. Box 335
Telephone: 6266

HUNTINGTON, W. VA.
Elliott Northcott
606 13th Ave.
Telephone: 3-8578

McNALLY PITTSBURG
McNally Pittsburg Manufacturing Corporation
General Offices: Pittsburg, Kansas

feed rollers; automatic and manual bead-lapping control; angling device for head on carriage; and rectifier DC source of welding current.—Leader Welding & Mfg. Co., Berkeley 2, Calif.

TWO-WAY MOBILE RADIO (7)

New mobile two-way-radio communi cations equipment for use in the ultra-high-frequency (UHF) band provides new opportunities for mine and other users, the maker states. The system employs the new RCA Type CMU-10A mobile transmitter-receiver in conjunction with any one of three available UHF base stations: Type CSU-20A, desk console; CSU-20ACR, rack station; or CSU-100ACR, rack station. The new equipment, the company states, provides for as many as 80 new channels of communication in the 450- to 470-megacycle portion of the spectrum.—RCA Victor Div., Radio Corp. of America, Camden, N. J.

DC WELDERS (8)

New features listed for the 200-, 300- and 400-amp Metal & Thermit DC generator welders are: (1) one-dial control providing close control of welding current by electrode size selector and large easily adjusted dial for minor current adjustments; (2) convenient current control by setting electrode selector and then turning calibrated current dial to desired heat—reversing switch provides quick, easy change of polarity; (3) magnetic motor starter, pushbutton-operated, across-the-line, incorporating two automatic-reset thermal-overload relays for overload and low-voltage protection.—Metal & Thermit Corp., 100 E. 42d St., New York 17.

HEAVY-DUTY BELT IDLERS (9)

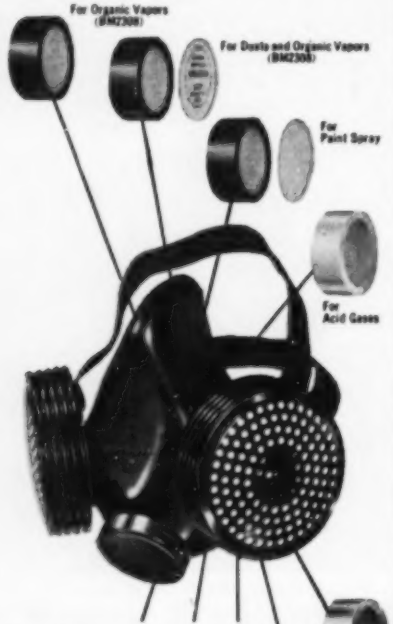
Said to incorporate field-tested improvements in Transall's permanently-lubricated design, new Trans-Seal heavy-duty conveyor idlers feature: (1) molded bearing-cavity enclosures on both sides of each bearing for effective "front-line" protection against abrasives and moisture; (2) improved heavy-duty precision-type bearings, permanently sealed and packed with premium synthetic lubricant; (3) improved method of mounting bearings eliminating any possibility of axial preloading during assembly. More details in Bulletin 206—Transall, Inc., 150 N. 11th St., Birmingham, Ala.

SHAFT-MOUNTED REDUCER (10)

Under the name "Shaft-King," a new 13:1-ratio series of shaft-mounted speed-

NEW
WILLSON
Interchangeable Respirator

First truly interchangeable respirator. Requires no additional parts or accessories to use any one of the cartridges, filters, or combinations shown.


For Organic Vapors (BMZ308)
For Dusts and Organic Vapors (BMZ308)
For Paint Spray
For Acid Gases
For Organic Vapors and Acid Gases
For Ammonia
For Metal Fumes, Dusts and Mists (BMZ149)
For Radioactive and Beryllium Dusts, Mists or Fumes
For Dusts and Mists (BMZ162)

These Respirators are individually packed in sealed, transparent plastic bags enclosed in a sturdy metal-edge box.

Write for the new Bulletin fully describing these new Willson Respirators. Standardization on the new Willson No. 800 Interchangeable Respirator can greatly simplify your respiratory protective inventory.

More Than 300 Safety Products

Carry This Famous Trademark

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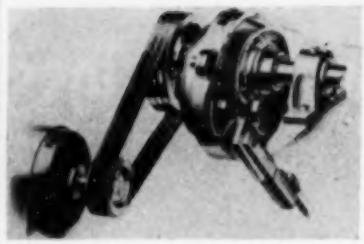


reduction units is said to extend the advantages of the original 20:1-ratio series to V-belt drives for a variety of slow-speed equipment. Adaptable to any shaft size up to $3\frac{15}{16}$ in, the reducers are said to be extremely compact, requiring only standard shaft lengths for mounting directly on the driven-machine shaft. Two trains of flame-hardened helical gears reduce driven-shaft speed. The reducers may be equipped with American torque-arm overload releases, or with an internal backstop where reversing must be prevented. Release and backstop are optional.—American Pulley Co., 4200 Wissahickon Ave., Philadelphia.

GAS-GASOLINE ENGINES (11)

With the addition of seven new 6-cylinder models, the International Harvester gas-gasoline power-unit line now includes 12 engines ranging from 16.5 to 200 new maximum horsepower, the maker reports. The new valve-in-head units and their ratings are: U-1091 (natural gas), 180 net horsepower at 1,375 rpm up to 200 at 1,600 rpm on factory-approved applications; U-450, 102 hp, 1,800 rpm; U-406, 91 hp, 1,800 rpm; U-372, 83 hp, 1,800 rpm; U-269, 62 hp, 1,800 rpm; U-240, 55 hp, 1,800 rpm; U-220, 50.5 hp at 1,800 rpm. Other than the U-1091, the six new models are power units with International truck engines. Each is said to bring higher-speed operation to direct power applications with savings in operating cost. More details from International Harvester Co., 180 N. Michigan Ave., Chicago 1.

CRAWLER SHOVEL-CRANE (12)

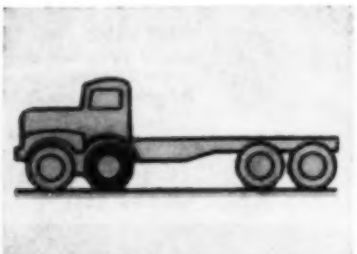
Bearing the model designation of C-35, the new Bantam crawler-mounted shovel-crane has a ⅜-cu yd 5-ton rating. It also can be used as a dragline, clamshell and the like with appropriate front-end attachments. Features include power lowering as well as raising, 6-rpm swing speed, full revolving, and 175-fpm line speed. Without front-end attachment, and with 16-in pads, weight runs 15,522 lb, including 1,400-lb counterweight. With counterweight but without front-end attachment, list price fob factory in Waverly, Iowa, is $9,350.—Schield Bantam Co., Waverly, Iowa.

SHOVEL-CRANE-DRAGLINE (13)

Adapted to a wide variety of work and available with either crawler or rubber mountings, the new Lima Type 44 1-cu yd shovel or 25-ton crane also may be employed as a dragline, clamshell or pull shovel with appropriate front-end equipment. As a shovel, the unit is equipped with a 20-ft boom and 18-ft dipper handle. Crane booms are available up to and including 100 ft, less jib (15-, 20- and 30-ft jibs are available).—Additional details from Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio.

AUTOMATIC DRILLING MACHINE (14)

Features of the new Thor No. 380 automatic drilling machine, according to the company, are an integral air-leg feed and automatic air-water backhead. Total weight is 80 lb, and the machine is equipped with a specially designed 45-lb sinker rock drill and a 2½-in-diameter feed leg in 36- or 48-in lengths for all types of drilling at all angles. The drill can be removed from the leg and used as sinker by loosening one nut.—Thor Power Tool Co., Aurora, Ill.



TANDEM FRONT AXLE (15)

To increase the legal payload of trucks, Chain Belt offers the new Rex-

B.F. Goodrich

Universal tires carry up to 30 tons, give full traction up steep grades

THE truck above, one of 70 owned by a Pennsylvania anthracite coal stripping firm, has just completed a trip from the bottom of a coal pit to the dumping platform. Loads run as high as 30 tons, and the trucks climb a steep road covered with razor-sharp rock. Tires take a terrific beating on hauls like this, costs skyrocket.

But this company uses B.F.Goodrich Universal tires, reports many tires have given 3,500 hours of service and are still going strong. Even after this rugged work Universal tires can be recapped for an additional 2,000 to 2,500 hours. One reason for this amazing record is the patented B. F. Goodrich nylon shock shield. Layers of strong elastic nylon cords under the tread stretch together to absorb smashing impact. Universal tires give you this 4-way saving:

(1) more original hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation. You pay no more for the BFG nylon shock shield.

The Universal wedge-shaped cleats defy slippage, give 2-way traction. Specially-compounded rubber resists rock cuts and snags. Let your local B. F. Goodrich dealer show you how Universal tires can save you money. His address is listed under Tires in the Yellow Pages of the phone book.

Specify B. F. Goodrich tires when ordering new equipment

UNIVERSAL TIRES HAUL COAL over some of the roughest terrain in the Pennsylvania anthracite region. Even in this severe service Universal tires often can be recapped. Because these B. F. Goodrich tires can be mounted on any wheel position, you need fewer spares.

70 TO 85 THOUSAND POUND GROSS LOADS are carried by BFG tires month after month over rock-strewn roads and over no roads at all. The tires above have already rolled 3,450 hours! One reason for this amazing service is the B.F.Goodrich nylon shock shield.

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

The B. F. Goodrich Company
Department TO-190, Akron 18, Ohio

Please send me:

- ☐ Free information on off-the-road tires
- ☐ Free book, "How to get more recaps out of truck tires"
- ☐ Name of my nearest retailer

Name_____

Company_____

Street_____

City_____ Zone____ State_____

Spangler dual-steering tandem front axle. The unit is an additional steering axle coupled to the standard front axle of a truck by a walking beam. The result is a tandem bogie that steers all front wheels with centerpoise steering. Advantages in addition to a greater legal payload, according to the builder are: no jackknifing; same turning radius as the standard truck; and elimination of skidding because all four wheels steer without cramping or binding. Capacity, the company states, is increased as much as 5 to 7 tons.—Chain Belt Co., Milwaukee, Wis.

ROCK-TYPE DUMP BODY (16)

Designed for power-shovel, chute and conveyor loading and the extra-heavy-duty hauling of abrasive materials, the new Galion "rock-type" dump body is available in sizes from 5 to 15 cu yd. The body is constructed of high-tensile-steel plate, without the side bulging said to be the most-common cause of failures. The body floor is reinforced with a 2-in hardwood liner, and a 15-deg-angle scow-type rear end eliminates the need for a tailgate. A "Distorber" on each side of the body and hoist frame absorbs damaging warp and strain and is said to reduce maintenance expense and lengthen life.—Galion Allsteel Body Co., Galion, Ohio.

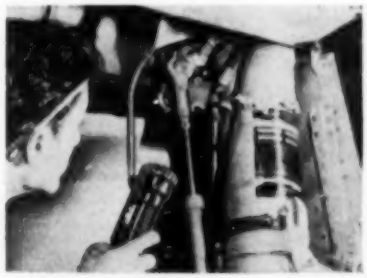
HEAVY DUTY DIESEL (17)

A new, lightweight, heavy-duty diesel engine for stationary and portable service has been announced by American Locomotive Co., Schenectady 5, N. Y. The engine, known as Model 251A, is a 6-cylinder, 4-cycle turbocharged diesel of 9-in bore and 10½-in stroke, rated at 690 hp at 900 rpm. The engine is intended for continuous or standby duty and is designed for such applications as electric-power generation, pumping and dredging and for portable units mounted on skids, trailers or rail cars. The engine base and frame are structural steel, resulting in light weight with no reduction in strength, and permitting light and economical foundations. Net weight of the engine is 21,350 lb and it is 11 ft 5 in by 7 ft 5 in by 4 ft 11 in. Full details from the company.

Equipment Shorts You'll Want to Check

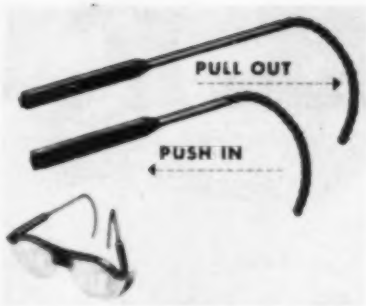
(18) TRUCK CRANE—High mobility is cited for the new Pitman Model 80 truck crane, available with a standard boom length of 25 ft and inserts to increase length to a maximum of 59 ft. Maximum rating at 25 ft is 4 tons; at 59 ft, ½ ton. The unit is designed for installation on 2½-ton or larger trucks. A fifth wheel may be installed on the crane's subframe permitting use of the same truck to haul a trailer.—Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City, Mo.

(19) STATIONARY COMPRESSOR—New 25-hp stationary air compressor, known as the Model 25D, designed for general industrial applications, has a displacement of 128 cfm and is directly connected to the electric motor. Weight is 1,635 lb. Dimensions are: length, 62 in; width, 38 in; height, 38 in.—Davey Compressor Co., Kent, Ohio.



(20) FLASHLIGHT for industrial and maintenance use, known as the Usalite "Duo-Flex," provides both a 1,000-ft beam and a probe light for pinpoint inspection of inaccessible parts and equipment. Extension of the probe-light arm is 10½ in.—U. S. Electric Mfg. Corp., 222 W. 14th St., New York 11.

(21) ADJUSTABLE TEMPLES (Retrax plastic) for Tuc-Away, Methaspec and Split-Joint safety spectacles telescope in



and out for a perfect spectacle fit and eliminate the need for stocking frames with temples of different lengths to fit various workers. Extra comfort is provided, the company points out, by a "ball-chain" style of hook.—Watchemoket Optical Co., Dept. N 76, Providence 3, R. I.

(22) STEAM-CLEANING NOZZLE—"Steam-Blaster" nozzle is said to be 40% more efficient than the conventional steam nozzle for any steam-cleaning task, including buildings, floors, vehicles, machinery, etc.—American Nozzle Corp., New York.

(23) WIRE-BRAID AIR HOSE for heavy-duty service and working pressures up to 400 psi also is designed for service where there is severe abrasion. Called "Commander," the hose is reinforced with a single braid of high-tensile steel and is said to be more flexible than other heavy-duty hose. It is manufactured in ½-, ¾- and 1-in sizes and features an oil-resistant hose tube, permitting tool-oiling through the hose, and a light-gray oil-resistant cover for increased visibility.—B. F. Goodrich Co., Akron, Ohio.

(24) ONE-COAT ALUMINUM PAINT, Dixon No. 117, according to the maker, has proved its ability to retain its color in exposures extending over 3 yr on steel panels exposed to the elements and the fumes encountered in a highly industrialized area.—Joseph Dixon Crucible Co., Jersey City 3, N. J.

(25) SAFETY GOGGLE—Designed for wear over prescription glasses, new Kover-Mor style goggle is offered in chipping and welding styles. Molded nylon eye cups, the maker states, are light in weight, tough, non-flammable and low in heat conductivity.—Willson Products, Inc., Reading, Pa.

(26) PORTABLE INDICATING INSTRUMENTS—Two series of improved portable electric instruments are designed for maximum convenience and readability, the maker states. They are available for indicating volts, watts, amperes and milliamperes. Type DP-11 is designed for general testing for electrical maintenance men who need a rugged easily read unit with an accuracy of ½% of full scale. Type DP-12 is a high-precision instrument for laboratory, field and production use, accurate to ¼% of full scale and suited to the maintenance of portable or switchboard instruments, control panels and numerous pro-

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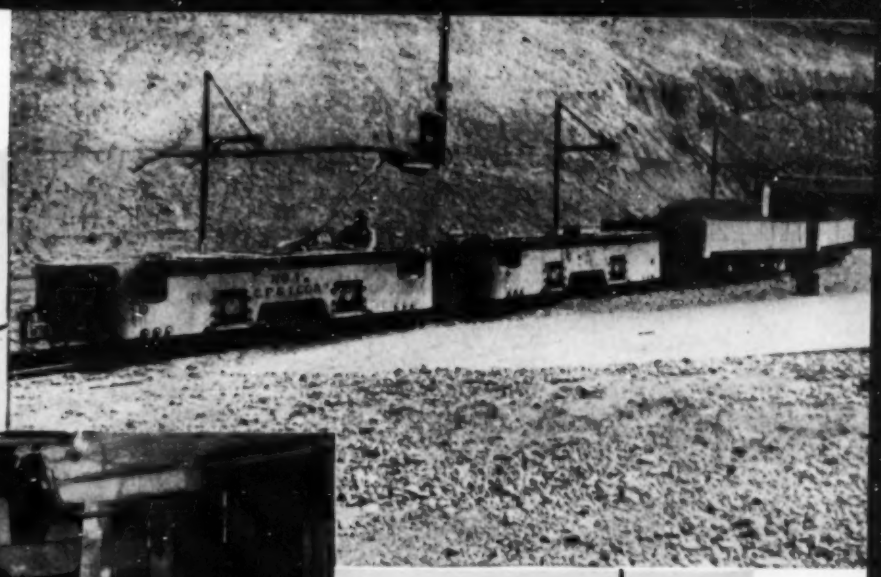

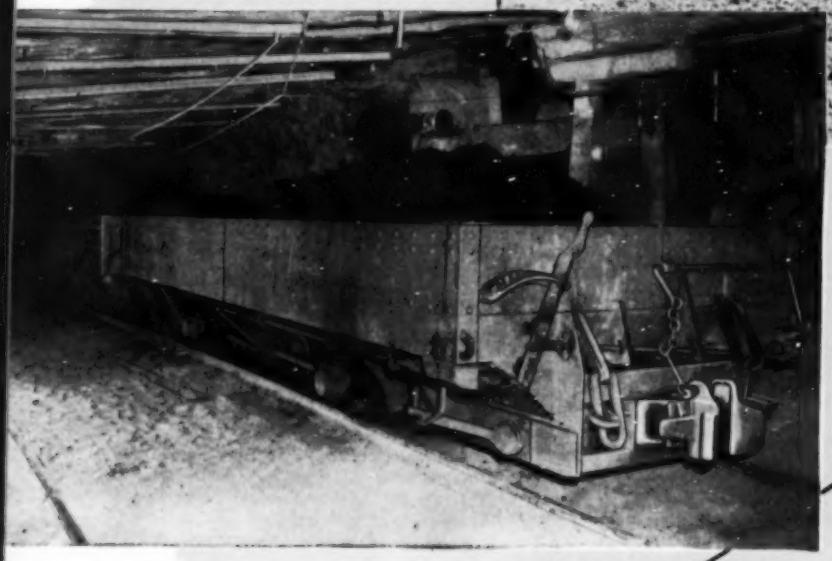

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CF & I's Allen Mine goes

100% WILLISON AUTOMATIC COUPLERS AND NATIONAL RUBBER-CUSHIONED DRAFT GEARS

COLORADO FUEL & IRON COMPANY specified Willison Automatic Couplers and National Rubber-Cushioned Draft Gears *throughout* for the complete fleet of Goodman locomotives, Allison drop-bottom cars, and Differential man-trip cars at its new Allen Mine, newest and largest coal operation in the Far West.

Increased Output per day . . . Greater Safety for personnel

Willison Automatic Couplers eliminate need to go between cars to couple or uncouple . . . give faster shunting and gathering . . . less spillage . . . no uncoupling during dumping operations. And National Rubber-Cushioned Draft Gears permit greater operating speeds . . . reduce wear and tear on rolling stock and trackage . . . cut spillage substantially.

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NATIONAL MALLEABLE and STEEL CASTINGS COMPANY
Cleveland 6, Ohio

WILLISON AUTOMATIC COUPLERS • RUBBER & FRICTION DRAFT GEARS • NC-1 CAR TRUCKS
NACO STEEL WHEELS • NACO STEEL LINKS & SWIVEL HITCHINGS

NATIONAL
PRODUCTS and TECHNICAL SERVICES

duction devices. Each instrument measures 7¾ x 7⅞ x 3¼ in and weighs 5 lb.—General Electric Co., Meter & Instrument Dept., Schenectady 5, N. Y.

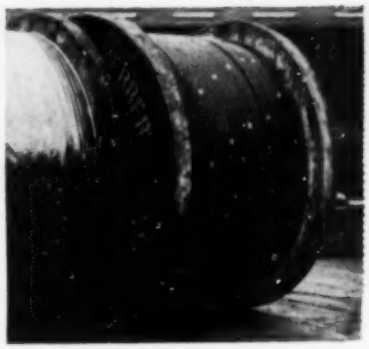
(27) COMBINATION CHAIN for bucket elevators and conveyors, when used with Beaumont "Trac-Pull" patented drive wheels, are said to provide increased efficiency in operation, greater service life and reduced maintenance costs. The new chain, it is pointed out, has from 450 to 600% more metal on the wearing tread of each link.—Beaumont Birch Co., Philadelphia.

(28) WATER REPELLENT—A wide variety of materials ranging from paper to clay and concrete, including dirt roads, can be made water repellent by treating them with Dow-Corning XS-1, according to the manufacturer. A solution of sodium salts of certain silicones, this new product, it is stated, may be easily diluted with water and applied by brush, spray or dipping, or by mixing with paper or clay slurries. Additional information in Data Sheet 8-100, Dow Corning Corp., Midland, Mich.

(29) PLASTIC TEE FITTING—Available in run sizes up to 2 in, new reducer insert tee fitting has side outlet one standard pipe size smaller than the run. It facilitates the installation of step-down laterals in plastic-pipe systems. The new fitting, the maker states, is quickly and easily joined in the same manner as standard insert couplings. No special tools are required and complete connection can be made within 2 min.—Carlon Products Corp., 10225 Meech Ave., Cleveland 5.

(30) HYDRAULIC PUMPS—Utilizing the rotating-piston design, new larger-horsepower 32-10 Series Rotodraulic hydraulic pumps, fluid motors and transmissions may be used as pumps or motors interchangeably. They are instantaneously reversible in either application, with equal performance in either direction, the company states. As pumps, displacements are 60, 120 and 180 gpm, 1,000 psi continuous, 1,500 psi intermittent. Built-in gears permit direct connection at 1,200, 760 or 472 rpm. Overhung belt or chain drives are permitted. As fluid motors, ratings up to 300 hp and 19,000 lb-in or torque are obtainable at 1,100 rpm.—Oliver Iron & Steel Corp., Berry Div., Oliver Bldg., Pittsburgh 22.

(31) CALIBRATED WIRE ROPE—All 20 diameters of Paulsen-Webber wire rope, ranging from ⅛ to 1½ in, are



marked with gold or blue bands at 5-ft intervals as standard practice, but may be marked at any desired intervals for accurate measurement. Currently, P-W is producing its "Gold-Band" and "Redi-Measured" marked rope in two top grades —improved and regular plow steel. No additional charge is made for marking, the company states while pointing out that marking at the factory saves time and the hazard of rope damage for the user.—Paulsen-Webber Cordage Corp., New York.

(32) SILICONE INSULATION—New tough SE-100 silicone-rubber coating is making possible such improved insulating materials as Class H fiberglass tubing and sleeving with unusual dielectric strength and lifetime retention of flexibility, according to the maker. In addition to imparting flexibility, heat resistance and electrical strength to all types of glass-cloth insulation, S-100 silicone rubber is said to be useful as an encapsulating material for coils and cores, and as an impregnant for heater ducts, gaskets, seals and diaphragms. It is available as base stock and as a dispersion (SE-100S). —General Electric Co., Silicone Products Dept., Waterford, N. Y.

(33) BOOKKEEPING MACHINE permits accounts receivable posting in a single writing with each charge or credit posted simultaneously to statement, ledger and journal, according to the maker. The machine is described as a low-cost unit, which saves costly transcribing, checking and adding-machine calculations. More details in Booklet AB665, Remington Rand, Inc., 315 Fourth Ave., New York 10.

(34) HIGH-PRESSURE AIR HOSE for mining, tunneling and construction is stated to combine unusual strength and ruggedness with extreme flexibility while the steel wire used in the horizontal braided construction enables the hose to carry working pressures as high as 2,000 psi. Called Concod Yellow Jack, the hose is provided with a specially compounded yellow cover for ready visibility, and is made in eight different sizes from ⅜ to 2½ in outside diameter.—Boston Woven Hose & Rubber Co., Box 1071, Boston 3.

(35) SHEET MICA—Developed for motors and generators operating up to 150 C, new G-E 77520 flexible sheet mica is believed by the company to be the first product ever to impart flexibility with a binder content of only 7 to 11%. It can be stored twice as long, and flexibility and low binder content permit replacement of several different grades previously stocked for special applications. Properties include ability to bend sheets up to 10 mils thick around a ½-in mandrel without chipping, while thicker sheets can be bent around a 1-in mandrel. It is easily formed without heating, the maker states, for armature slots under end windings, at crossovers, and at field-coil terminals. Minimum dielectric strength is 350 v per mil of thickness up to 20 mils and 300 v per mil for thicker material.—Additional data from General Electric Co., Laminated & Insulating Products Dept., Pittsfield, Mass.

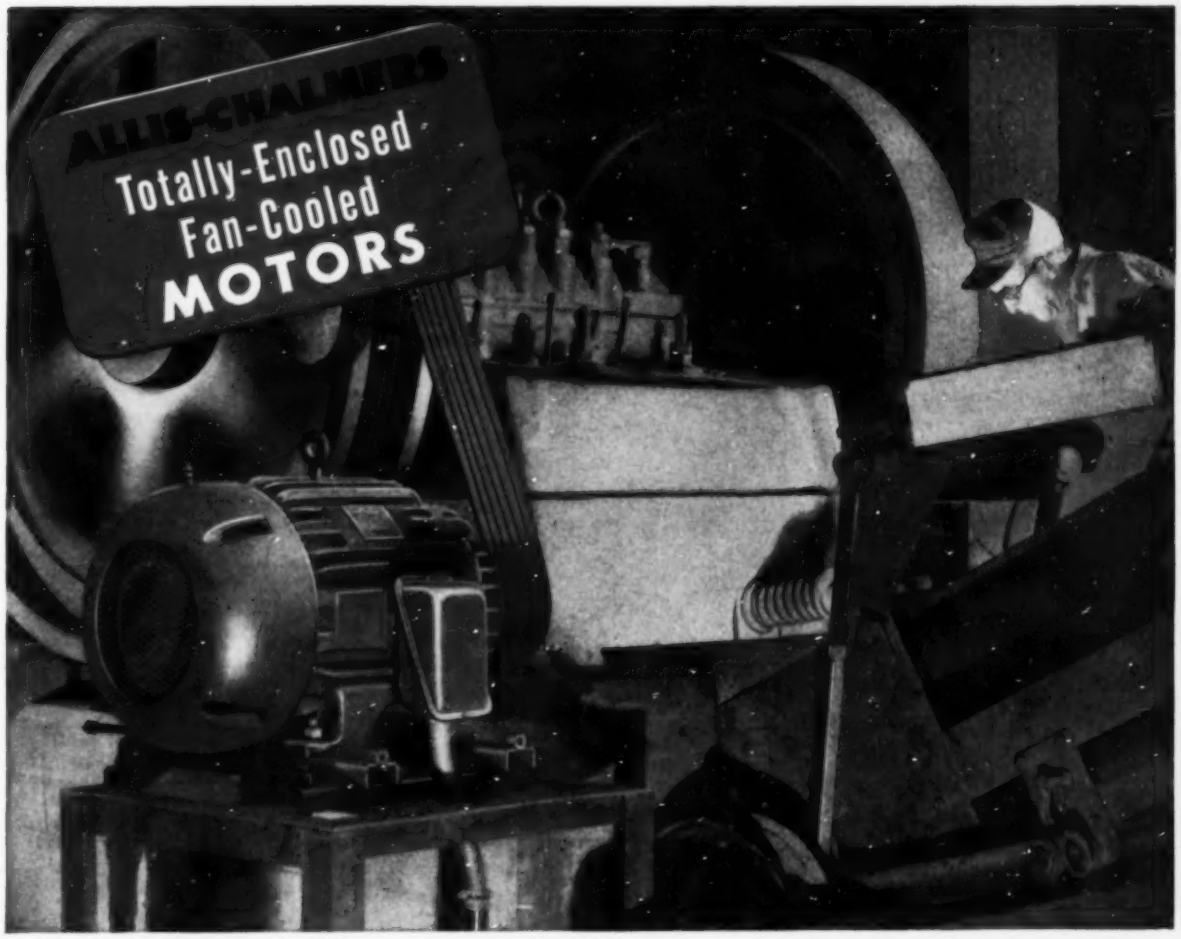
(36) SILICONE RESIN—New SR-17 silicone resin, according to the manufacturer, is said to possess an unusual combination of heat resistance, low-temperature flexibility and high bonding strength, permitting use in a variety of insulating applications ordinarily requiring several different materials. Curing is altered to meet high- or low-temperature requirements.—General Electric Co., Silicone Products Dept., Waterford, N. Y.

EQUIPMENT BULLETINS AVAILABLE

(37) FOR THE PREPARATION MAN, American Cyanamid Co., Mineral Dressing Div., 30 Rockefeller Plaza, New York 20, offers a new publication in its Mineral Notes series entitled "Heavy-Media Separation Processes for Mineral Concentration." This latest bulletin includes descriptions of representative heavy-media plants, including a section devoted to coal preparation, and also contains a complete bibliography on heavy-media separation. The number of ore-dressing and coal-preparation plants using these processes has grown from only 19 in 1945 to over 175 operating or planned installations in 27 countries, Cyanamid reports. Current annual feed rate to these plants, coal or ores, is in the vicinity of 55,000,000 tons.

(38) IF YOU'RE CONCERNED WITH CAR-DUMPING AND HANDLING, a new 24-p bulletin entitled "Mine-Car Dumping and Control Equipment" is offered you by the Nolan Co., Bowerston, Ohio. It illustrates and describes rotary and gravity car dumpers, trip feeders, car hauls, feeder-retarders, self-dumping and platform cages, and caging and accessory equipment, featuring the new Nolan Porta-Feeder for trip-loading and plans for using this unit for automatic car loading at conveyor heads.

(39) PARTS SERVICE—Euclid Road Machinery Co., Parts Dept., Cleveland 17, offers a 24-p booklet, "With Euclid Parts Service," marking, among other things, expansion of the Parts Dept.



Get These 3 Low Maintenance Features

1 Wide Open Air Flow

No enclosed external air passages to clog. Easy to clean with cloth, brush, air hose or vacuum. Simply remove fan cover and whole radiating surface is exposed for inspection and cleaning.

2 Cast Iron Construction

Frame, conduit box and fan cover of cast iron resist corrosion. Fan is non-sparking, corrosion-resistant material. Well suited to outdoor operation.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

3 Pre-lubricated Bearings

Ball bearings are double-shielded type, pre-lubricated at the factory. Periodic lubrication is not required under normal operating conditions, but provision is made for in-service lubrication if necessary.

GET COMPLETE INFORMATION on Allis-Chalmers motors for indoor and outdoor service — complete with Allis-Chalmers coordinated control — from your nearby A-C Authorized Distributor or District Office, or write for Bulletins 51B7286 and 51B7149. Allis-Chalmers, Milwaukee 1, Wisconsin.

Sold . . .
Applied . . .
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by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE V-belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

ALLIS-CHALMERS

A-4038

OVER 8,600 HOURS ON THE METER
...AND NO DOWN-TIME

Colonial Coal Co. is 100% Caterpillar powered at this strip mine near Madisonville, Ky. The Caterpillar D8 Tractor with Cat No. 8A Bulldozer, pictured above, is 'dozing No. 12 coal directly out of a vein four feet thick. Note the rolling action and high blade load. This Caterpillar 'Dozer moves a lot of coal in an eight-hour working day. In two years it has worked over 8,600 hours—with *no down-time!* "All we've done is tighten the tracks and rollers," says C. A. Kelly of Colonial Coal Co. "That's real dependability. No wonder we prefer Caterpillar over any other machines."

Two other D8s drive air compressors—one a 600-ft. Jaeger, and the other a 500-ft. Worthington. Both compressors power Cleveland drills. A Caterpillar D7 Tractor completes Colonial's "stable" of powerful yellow machines.

Precision Caterpillar manufacture builds years of extra life into every piece of equipment. Your Caterpillar Dealer will gladly talk over your needs, and show you how standardizing on Caterpillar can step up your output and cut your operating costs.

EXTRA FEATURES OF CAT NO. 8A BULLDOZER

Matching power of D8 Tractor to blade capacity of its teammate, the No. 8A Bulldozer, means easy maneuvering and long, trouble-free work life. Moldboard is scientifically curved for rolling, higher production loads. Blade features hard-wearing, high-carbon steel cutting edge, and extra-heavy bracing for extreme rigidity. Choice of cable or hydraulic control, angling or straight blade, to fit your requirements.

CATERPILLAR, PEORIA, ILLINOIS

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DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

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Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (Sept., 1953)

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4	11	18	25	32	39	46	53	60	67	74	81
5	12	19	26	33	40	47	54	61	68	75	82
6	13	20	27	34	41	48	55	62	69	76	83
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Company .....

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when operations were moved to a new plant at 18222 Lanken Ave., Cleveland. How the Parts Dept. is set up and operated for improved service is the theme of the booklet.

(40) COAL-RECOVERY DRILLS—4-p folder offered by the Salem Tool Co., Salem, Ohio, shows the specifications and performance characteristics of the new self-moving McCarthy coal-recovery drill. Salem Tool manufactures coal-recovery drills using 4-, 6-, 12- and 24-ft augers in diameters from 16 to 48 in. Drills are variously equipped with hand or hydraulic jacks, hand or power cranes, and hand and power moving facilities to meet customer requirements.

(41) BELT-CONVEYOR IDLERS—More than 500 belt-conveyor idlers in 34 types designed to meet practically every requirement are pictured and described in new 48-p Book No. 2416 just released by the Link-Belt Co., 307 N. Michigan Ave., Chicago 1. Light-, medium- and heavy-duty 20-deg troughing idlers; two styles of 45-deg idlers; flat-belt, belt-training, rubber-cushion and the new Link-Belt variable-troughing idlers are included, together with return-belt idlers and such accessories as idler stands, grease-pipe extension, and a grease-seal and bearing extractor. Detailed information is provided for selection and spacing, based on weight and lump size of material. Schematic drawings and dimensional data are included for each type of idler.

(42) CABLE FAULT-FINDER—Bulletin F38, Joy Mfg. Co., Dept. CFF-1, Oliver Building, Pittsburgh 22, features the company's new lightweight (23 lb) cable fault-finder for locating open circuits or low and high-resistance shorts of 10,000 ohms or less in rubber, neoprene, thermoplastic or similar jacketed cables. Rugged construction and ease of operation are stressed, and both the self-contained transmitter and receiver (separate units) are powered by standard easy-to-replace dry cells. All parts may be placed in one case for carrying.

(43) DC MOTORS from ⅛ to 300 hp, and DC generators, ¾ to 250 kw, are presented in new Bulletin 1450 by the Louis Allis Co., Milwaukee 7. Topics treated include details of DC mechanical construction, DC motor enclosures for different operating conditions, DC motor applications, special Louis Allis DC designs, motor-generator sets, DC electrical characteristics, the features, advantages and application of shunt, series and compound motors, motor starting, and DC adjustable-speed applications.

(44) MOTOR, CONTROL AND GEARING APPLICATIONS in modern coal mining are analyzed in a new 26-p Bulletin B-5619 available from the Westinghouse Electric Corp., Box 2099, Pittsburgh 30, along with recommendations for the specific drive meeting the needs for each application. Coal mining service conditions covered, with motors, gears and controls specially developed for them, include dusty and dirty locations, hazardous applications, shock and vibration, moisture, variable load requirements, space and weight limitations, dependability and minimum servicing.

(45) FIRE PUMPS—Ingersoll-Rand Co., 11 Broadway, New York 4, offers Bulletin 7226 describing its line of horizontal single-stage, and vertical multi-stage fire pumps for permanent installation in hose-line or sprinkler fire-protection systems. The pumps may be supplied with approved fire fittings and are applicable to booster service.

(46) OIL-FREE AIR COMPRESSORS—Bulletin A-44 offered by the Joy Mfg. Co., Pittsburgh 22, provides full data on the Joy WGO-9 oil-free compressor, a heavy-duty vertical unit designed for applications where the compressed air must be completely free of lubricating oil. Specifications on Joy's complete line of nonlubricated compressors from 172 to 8,800 cfm, 25 to 600 hp, also are included.

(47) "TALL TALES AND FABULOUS FACTS," a 24-p booklet published on its 10th anniversary by the Dow Corning Corp., Midland, Mich., retells some of the tall tales of Paul Bunyan, Davy Crockett and others, relating to them some of the "Fabulous Facts" about silicones. Calling silicones "a frontier of modern science demonstrating that in our times the tallest tales are told in technical terms," the booklet interestingly outlines the tremendous growth of silicones, their success in many "impossible" applications and their use in varied industries.

(48) MINING TOOLS—Supplement CM-112 to Catalog CM-110, issued by the Carboloy Dept., General Electric Co., Detroit 22, shows features and specifications for four new mining tools: CC-3 extra-heavy-duty bit; WAPT-22 prong-type roof-bolt drill for both wet and dry drilling; and AD-36 auger drill, 2⅛-in-diameter auger drill with $1^{13}/_{16}$-in hex shank.

(49) LIQUID LININGS AND COATINGS—New folders by Gates Engineering Co., Box 1711, Wilmington, Del., entitled "Gaco Vinyl Liquid Linings and Coatings," describes the Gaco line of protective coatings for drums, tanks and similar applications.

(50) CLASSIFIER—Bulletin C1-S-2, 20 p, presents the Wemco S-H classifiers, including operating notes and calculations necessary in wet-classification processing, as well as handy reference tables listing classifier specifications and capacities. Available from Western Machinery Co., 760 Folsom St., San Francisco 7, which points out that the Wemco Coal Spiral is an adaptation of the basic classifier.

(51) STATIONARY COMPRESSORS—8-p booklet contains full data on stationary compressors built by Davey Compressor Co., Kent, Ohio, in sizes from 10 to 100 hp, 55 to 540 cfm. A table shows the number of tools of various types that may be operated by each size unit.

(52) DIESEL LOCOMOTIVES—Deutz diesel locomotives for mine, narrow-gage and shunting work are illustrated and described in 11 bulletins and folders published by Klockner-Humboldt-Deutz AG, Germany. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(53) POWER UNITS—Deutz diesel-electric power sets, 3-phase service in various sizes are shown and described in bulletin issued by Klockner-Humboldt-Deutz, AG, Germany. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(54) CRUSHERS AND BREAKERS—Humboldt Expa-Breakers, Dupra-Breakers, hammermills and roll crushers are illustrated and described in bulletins by Klockner-Humboldt-Deutz AG, Germany. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfort am Main.

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(55) COAL-WASHING EQUIPMENT—New bulletins describe and illustrate the following equipment for wet-washing and treating coal built by Klockner-Humboldt-Deutz AG, Germany: Humboldt sink-float separator; Humboldt flotation machines; Humboldt thickeners; and Humboldt inclined-baffle-type densifiers. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfort am Main.

(56) AIR CLEANER—New bulletin describes Humboldt pneumatic jigging machine of Klockner-Humboldt-Deutz AG, Germany, including typical plant flowsheet and details of operation. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(57) MAGNETIC PULLEYS built by Klockner-Humboldt-Deutz AG, Germany, including sizes and operating characteristics, are listed and described in bulletin available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(58) RESONANCE SCREEN—Klockner-Humboldt-Deutz AG, Germany, offer new bulletin on the Humboldt counterbalanced resonance screen. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(59) AIR SIZING AND DUST COLLECTION—Humboldt dust collectors and air-sizing systems are the subjects of new bulletins from Klockner-Humboldt-Deutz AG, Germany. Available from Georg J. Lindner, Wittelsbacher Allee 60, Frankfurt am Main.

(60) PIPE TOOLS—Condensed 8-p quick-reference catalog suitable for punching for 3-ring binder shows entire lines of pipe tools made by Beaver Pipe Tools, Inc., Warren, Ohio, and includes user's prices.

(61) DRY-TYPE TRANSFORMERS—Type E totally enclosed nonventilated dry-type transformers are presented in Booklet B5812, Westinghouse Electric Corp., Box 2099, Pittsburgh 30, which analyzes savings from reduced maintenance, elimination of vaults or protective barriers, high voltage close to the load and ease of handling as a result of being lighter and smaller. Ratings are 3 to 50 kva, indoor or outdoor service.

(62) AIR-HANDLING UNITS built by Westinghouse Electric Corp., Sturtevant Div., Dept. T-071, 200 Readville St., Hyde Park, Boston 36, are illustrated and described in Bulletin 1600, along with installation considerations and accessories.

(63) POWER-CONTROL UNIT—New 4-p folder illustrates and describes the new Baker PCU-75 power-control unit, including performance details on the new features of the multiple-disk clutch, simplified brakes, adjustable hand levers and sheave mountings.—Baker Mfg. Co., Springfield, Ill.

(64) WORM GEARING—How double-enveloping worm gearing has helped improve equipment design, performance and salability is the subject of a new 36-p illustrated booklet available from Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12. It is Bulletin CD-173. Standard Cone-Drive gears are available in a wide range of sizes. Standard center distances of 2 to 18 in provide horsepower ratings up to 800 hp. Ratios range from 5:1 to 4,900:1.

(65) ARCWELDING MACHINES—Catalog 1340, Air Reduction Sales Co., 60 E. 42d St., New York 17, illustrates and describes in its 44 pp over 20 different models of arcwelding machines, including DC m-g and engine sets, DC selenium rectifiers, AC machines especially for Heliwelding, and a wide range of AC transformer welders, plus running gear, foot controls and an automatic arcwelding head.

(66) COAL CLEANING—"Dorr Equipment and Methods for the Modern Coal Cleaning Plant" are covered in new Bulletin 7100, with illustrations, flowsheets, and size and capacity ratings. Equipment covered includes classifiers, the Dorrclone, hydroseparators, thickeners and the Type W pump.—Dorr Co., Berry Place, Stamford, Conn.

(67) LOCK NUTS—New 8-p booklet by Security Locknut Corp., Melrose Park, Ill., shows types, sizes and applications of Security Locknuts for various applications; also Security Studlocs.

(68) FIRE TRUCK—The "MSA Mine Fire Truck," pictured and described in new Bulletin 1203-1, Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh 8, is described as a specially designed unit with a 1,000-gal tank, 5-hp centrifugal pump delivering 50 gpm through up to 500 ft of 1½-in hose, combination fog and straight-stream nozzle, and permanent piping and valves.

(69) SPROCKETS AND ROLLER CHAIN—Bulletin A-624, "Taper-Lock Sprockets and Dodge Roller Chain," provides complete data for selection, specification and purchase of roller chain and sprockets, including Taper-Lock sprockets for chain from No. 40 to No. 100 inclusive, Taper-Lock bushings, Dodge roller chains, and roller-chain pin extractors. —Dodge Mfg. Corp., Mishawaka, Ind.

(70) SCRAPERS—The seven modern pull-type scrapers now available through Allis-Chalmers dealers are illustrated and described in a new 12-p illustrated catalog issued by the Tractor Div., Allis-Chalmers Mfg. Co., Milwaukee, Wis. Four units produced at the Cedar Rapids works and three Gar Wood units are shown providing struck capacities of 2 to 18 cu yd and adaptable to use with all-size crawler tractors in the field today.

(71) PUMP MOTORS—Louis Allis Co., Milwaukee 7, Wis., offers Bulletin 1250 covering its line of hollow- and solid-shaft vertical pump motors. Illustrated are the various types of enclosures available, special design features and the varied uses for the units in industry.

(72) FAN MANUAL, 64-p Aerovent Catalog 20 on industrial ventilation and air movement, offers engineering, installation and operating data for all standard and special-duty fan applications. Included are data for calculating duct sizes, friction losses, performance and horsepower requirements, with details of all Aerovent fans and accessories. From Aerovent Fan Co., Inc., Piqua, Ohio.

(73) COUPLING—Folder 101 on the new Morris dual-purpose coupling-repair clamp, available in diameters of 4 to 14 in for coupling or repair of gas, water and other pipe lines, contains complete price and specification data and illustrates the simple, speedy method of installation.—Morris Coupling & Clamp Co., Ellwood City, Pa.

(74) PORTABLE COMPRESSORS, the Davey Models 160 and 210 Super Chiefs, are described in Bulletin E-252 from the Davey Compressor Co., Kent, Ohio. Included are complete specifications for 2-wheel, 4-wheel and skid units, with details of the various components.

(75) PACKING CARE—New 112-p catalog, with index, on the proper installation and care of packings has been published by the Mechanical Goods Div., United States Rubber Co., Rockefeller Center, New York 20. In addition to in-

(Continued on p. 130)

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formation on what packings to use for various services, the catalog contains metric engineering tables, temperature conversion charts and material on maintenance of rod and plunger packings and gaskets.

(76) RUBBER BEARINGS—New 36-p indexed catalog, distributed by Lucian Q. Moffitt, Inc., 333 S. Main St., Akron, Ohio, national distributor of Cutlass water-lubricated rubber bearings for B. F. Goodrich, shows sizes, applications and specification data.

(77) SLEEVE PROTECTION—"Gortite Sleeve Protection" of bearings and other mechanisms for either fluid retention or exclusion of dirt is detailed in new Bulletin AH-2, with examples of sizes and lengths available. A & A Mfg. Co., 2017 W. Clyburn St., Milwaukee 3.

(78) CORE DRILLING—Types of Koebelite diamond core bits and where they should be used are detailed in the "Koebel Diamond Core and Drill Bit Selector," available from Koebel Diamond Tool Co., 9456 Grinnell Ave., Detroit 13.

(79) ELECTRICAL MEASURING — A revised edition of the company's 64-p measuring equipment catalog, Bulletin GEC-1016A, has been issued by the General Electric Co., Schenectady 5, N. Y. It presents more than 115 testing and measuring devices for laboratory and production use ranging from simple current indicators to completely automatic oscillographs; from surface roughness scales to mass spectrometers; from DC amplifiers to radiation monitors.

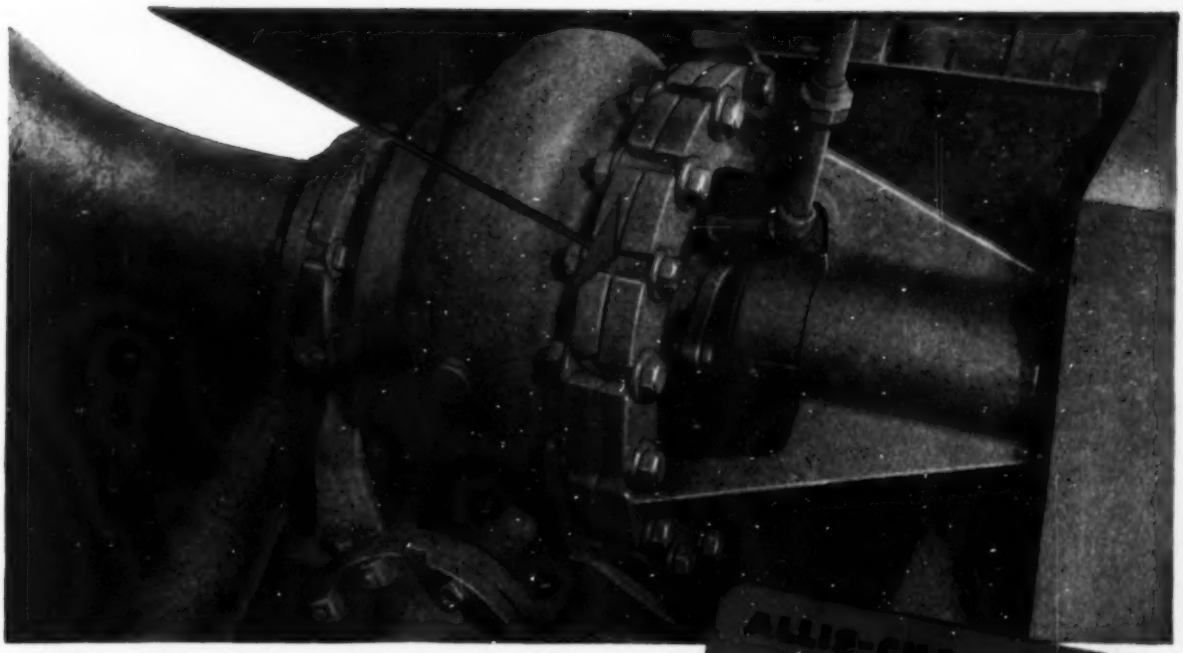
(80) SHAFT COLLARS—Hallowell steel shaft collars for various applications are shown in a new bulletin by the Hallowell Shaft Collar Div., Standard Pressed Steel Co., Jenkintown, Pa., along with sizes, weights and list prices of the 42 stock sizes, all fitted with Unbrako self-locking socket set screws.

(81) SELF-LOCKING NUTS — Flexloc Locknut Div., Standard Pressed Steel Co., Jenkintown, Pa., offers a new bulletin showing types, sizes and applications of Flexloc self-locking nuts.

(82) EXPLOSIVES FOR MINING are among the many products of Olin Industries, Inc., highlighted in a 48-p booklet describing the organization, activities, products and history of the company. Operations and products of the various Olin divisions covered include the Arms and Ammunition, Ecusta Paper, Electrical, Explosives, Export, Forest Products, Metals, Olin Cellophane and Ramset. The booklet is available from Olin Industries, Inc., E. Alton, Ill., or any Olin office.

(83) CRUSHERS — Booklet suggesting how to make the most efficient and satisfactory application of various crushers to specific jobs is offered by the Pennsylvania Crusher Co., Philadelphia 7. Important operating factors, such as power consumption, parts wear, maintenance costs and product uniformity, are fully discussed, along with a checklist for determining the best type of crusher. Various types of the company's products are described in detail.

Here's a Pump That Maintenance Men Like



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- **All maintenance points are easy to reach**
- **Pump can be taken down and returned to service in less than a half hour**
- **Many parts are interchangeable between different pump sizes**

THE Allis-Chalmers coal washing pump is ruggedly built to stand rough coal washing service. And it's easy to work on. Notice how accessible the packing gland is. See how the casing bolts are arranged. Just loosen the nuts a couple of turns and the bolts lift out.

Wearing parts separate into easily handled units. In fact, one man can tear down an Allis-Chalmers coal washing pump, replace a part and have it back in action again *in less than a half hour*. Piping need not be disturbed unless the casing is replaced.

Complete Pumping Unit Furnished . . . Allis-Chalmers can furnish the complete pumping unit — pump, motor, *Texrope* drive and control — assembled and ready to install and run. A *Vari-Pitch* V-belt drive makes it possible to vary head and capacity at the turn of a crank.

Get the Complete Story . . . Every Allis-Chalmers coal washing pump is application engineered by a specialist who knows coal washing equipment problems and how to solve them. Your nearby Allis-Chalmers representative will be glad to give you complete facts and figures on CW pump performance. Or write Allis-Chalmers, Milwaukee 1, Wisconsin and ask for Bulletin 52B6381.

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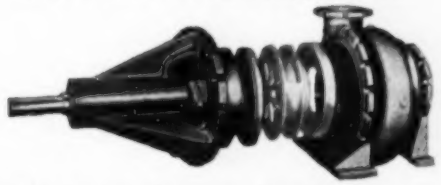


Impeller and suction plate now made of *Ni-Hard* alloy at no extra cost. You get longer wear, lower pumping costs.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

BRITONS CAN HAVE PROSPERITY —If They Want It

What is required to get Britain, our key ally in the grand alliance of the free world, firmly back on her economic feet? The purpose of this message is to throw light on this crucial problem, which afflicts our other European allies also.

At the moment, Britain is enjoying a respite from the economic crises (of 1947, 1949 and 1951-52) which have plagued her postwar course. This respite may well continue for some time. But almost no one whose judgment is trustworthy believes that Britain has acquired sufficient economic strength to safeguard her against further economic crises in the years immediately ahead.

Two British Views

New and clear light on what should be done to that end has recently been shed by two noteworthy British publications. One is a book, "We Too Can Prosper," by Graham Hutton, distinguished British economic writer and administrator. The other is an article, "The Riddle of Prosperity," published by THE (London) ECONOMIST, Europe's most eminent economic journal.

Combined, these two publications present in sharp relief the basic problem that must be handled successfully if Britain is to be safely solvent. As is implied by its title, ***the Hutton book demonstrates that Britain can be made prosperous by readily feasible procedures, patterned on what has been done in the United States, to increase its industrial efficiency. But, says THE ECONOMIST, with Mr. Hutton's book in mind, this is not the most basic problem, which is, "How shall we make the British people determined to be prosperous?"*** This is a problem of incentive or motivation.

Compared with that of the United States, average industrial efficiency in Britain, as in most of Western Europe, is low. In his book Mr. Hutton remarks that "fifty years ago an American industrial worker turned out roughly the same amount in a day as his opposite number in Britain, Germany or France. . . . Today, he turns out from two to five times as much."

In large part it is this lag in output per hour or "productivity," as the technicians call it, which makes Britain and other key countries in Western Europe a continuing prey to economic crises. Moreover, the great disparity in productivity between the U.S.A. and most

of Western Europe is a major barrier to knitting the free world into a smoothly working economic whole. As one observer put it, "when the American economy catches a cold, the European economy gets pneumonia." This is largely because Europe is so much weaker in productive strength.

No Shortage of Knowledge

Yet the knowledge which would enable the countries of Western Europe, and particularly Britain, to increase their industrial productivity has been mobilized and is readily available to them. It is with this process for Britain that Mr. Hutton's book is concerned. In the book he summarizes the findings and conclusions, virtually all of them unanimous, of 66 teams, composed of British industrial managers, technicians, shop workers and labor leaders. Over a period of three years these teams completed a comprehensive series of inspection and study trips in the United States under the sponsorship of the Anglo-American Council on Productivity. The product of that effort, he remarks, is "a set of documents the like of which, on such a scale and of such practical value, has never been seen in the history of international and cultural borrowing."

Psychology the Key

From study of these documents, Mr. Hutton concludes that better capital equipment is the key technical ingredient of higher industrial productivity in Britain, and constitutes "the most urgent . . . need of British industry." But he finds that ***even without new capital equipment a "15% rise in productivity can still be achieved by reorganization of work," and that such an increase would "solve Britain's chief social and economic problems."***

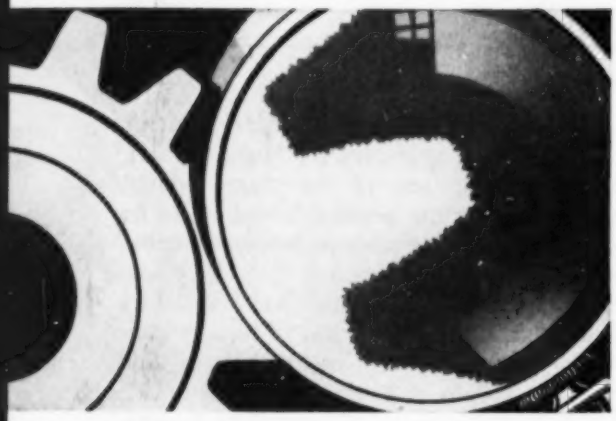
Then why is not such an increase in productivity, demonstrated by the Anglo-American productivity teams to be so clearly within technical grasp, promptly forthcoming? Mr. Hutton, quoting one of the team reports, remarks that, ***"'the greatest obstacles to increased productivity are psychological rather than technical.'*** We have to deal first and foremost with men, not machines." And THE ECONOMIST, pursuing the line of inquiry suggested, reaches the conclusion that, by and large, the people of Britain do not want to prosper by being more efficient. THE ECONOMIST says:

> "The real secret of American productivity is that American society is imbued through and through with the desirability, the rightness, the morality of production. . . . But in Britain, if any moral feeling at all survives about economic matters, it is usually a vague suspicion that economic success is reprehensible and unworthy. From this difference in attitudes everything else follows."

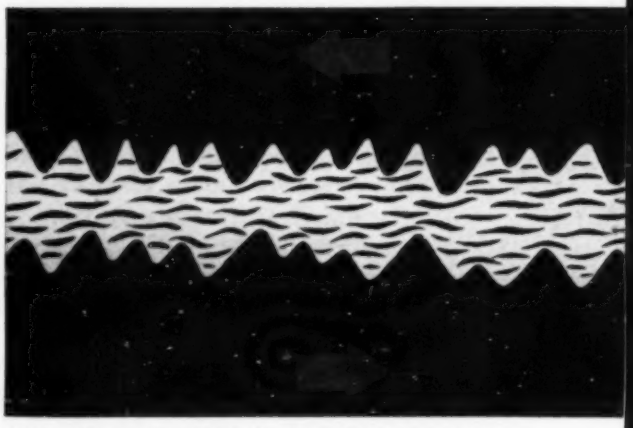
"How," asks THE ECONOMIST, "shall we set about restoring some belief in the rightness of effort, the morality of success?" For this question it has no ready answer. Neither have we. We are confident that the British people will neither be cajoled nor coerced into trying to match our productivity. Basically the problem seems to be to demonstrate clearly to them the truth of the proposition, set down by Graham Hutton, that "there is no goal, aim or end before a Good Society which the raising of that society's material productivity cannot render easier of achievement." Doing that in an old and settled country like Britain is obviously an extremely formidable undertaking. But ***until it is done, the crucial job of getting Britain and the rest of Western Europe firmly on its economic feet will remain to torment all of us.***

McGraw-Hill Publishing Company, Inc.

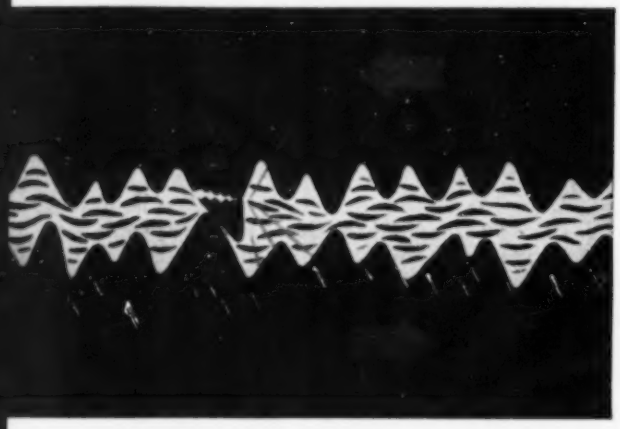
HOW SUNEP PREVENTS GEAR WEAR



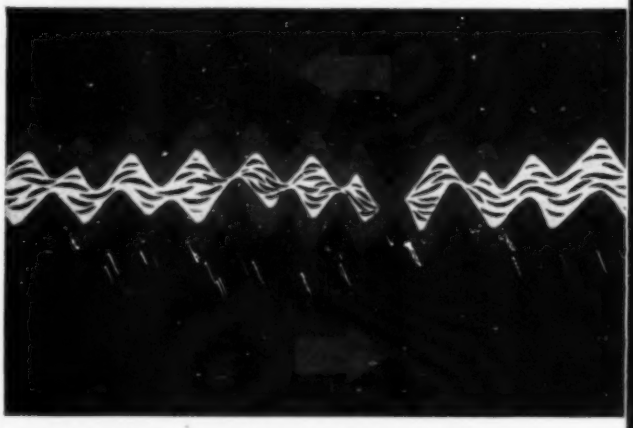
The surface of a gear may seem smooth, but when greatly magnified it looks something like this. The lubricant must keep these jagged edges apart.



With ordinary oil, a thick film is needed to keep these metal surfaces apart. The thickness of the film depends on the viscosity of the oil and other factors.



It is difficult to maintain a thick oil-film in everyday practice. The oil film thins out and semiboundary lubrication results. With ordinary oil, metal to metal contact occurs and gears wear.



Sunep coats the surfaces with a chemically bonded film which is virtually unbreakable. This film, although only about 0.0000001" thick, keeps the surfaces apart, withstands heavy loads and sudden shocks, prevents wear.

Sunep has many advantages. In addition to its outstanding load-carrying ability, it is noncorrosive; it keeps gears and bearings clean; it prevents rusting; it stays put. Sunep has proved especially effective for gear cases in locomotives, coal cutters, drilling machines, loaders, shuttle cars, etc. For more information about Sunep and how it protects your equipment, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. CA-9.

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News Round-Up

Anthracite Retailers, Producers Join in Fight for Markets

All segments of the anthracite industry are uniting in a concerted drive to recapture its declining tonnages, it was announced last month by Hugh O. Tompkins, chairman of a newly formed anthracite industry committee and managing director of the Fuel Merchants Association of New Jersey. Retailers, producing and distributing companies will embark upon a program to improve service to consumers and broaden the distribution of modern automatic equipment and other developments that in recent years have improved anthracite's convenience, economy and efficiency.

In spite of recent losses in tonnages, anthracite is one of the primary sources of domestic fuel on the eastern seaboard and is being supplied to approximately 5,000,000 families, according to estimates. The industry has just completed a series of market studies indicating that a sizeable portion of the loss may be attributed to the fact that a majority of the public are not aware of new automatic anthracite equipment and that some hold damaging misconceptions about the fuel.

The new industry committee of 22 members consists of executives of the state fuel dealers' associations, anthracite retailers and representatives of the producing companies. They will cooperate to organize regional, county and local committees in New England, New York, New Jersey and Pennsylvania. Headquarters will be in New York City, where members will meet regularly.

Based on the findings of the market surveys, Mr. Tompkins said the following facts were comparatively little known to the average consumer but of particular interest to those interviewed:

1. Anthracite does not smoke or create soot, and for this reason smoke abatement committees rate it one of the cleanest fuels and are specifying it more and more in their campaigns.

2. New equipment provides anthracite users with wholly automatic heating units that fit into the decorative schemes of basement playrooms, mechanically fed from dustproof storage space.

3. Automatic anthracite equipment will heat a six-room house at less cost than competitive fuels in 90% of the marketing area, according to statistics of the Anthracite Institute. In some areas the savings from use of anthracite are as much as 40%.

4. Anthracite has been a dependable source of supply for more than 150 yr. Contrary to the general impression, the anthracite industry has been practically free of strikes since 1926. For the past 25 yr industry-wide work stoppages due to strikes have only averaged 3½ days a year, and have not resulted in any major disruptions of supply, he stated.

5. Anthracite is a vital factor in the economy of the eastern seaboard, essential in case predicted shortages develop in other fuels or in the event of a national emergency.

6. Anthracite has several definite and little-known inherent advantages in terms of safety, health and comfort. Local surveys have indicated that there is less incidence of fire and explosion in anthracite homes. A research study made several years ago showed less incidence of respiratory illness in anthracite-heated homes, especially among children under 16 and adults over 60. The industry intends to investigate this health factor more thoroughly and hopes to develop convincing current statistics.

Producer representatives on the committee include: Milton H. Davis, Pennsylvania Coal Co.; Truman Dodson, Weston Dodson Co.; John J. Mulligan, Lehigh Valley Coal Sales Co.; H. H. Shaver, Hudson Coal Co.; John J. Shipherd, D. L. & W. Coal Co.; Clyde H. Stephens, Philadelphia & Reading Coal & Iron Co.; James J. Tedesco, Pagnotti Coal Co.; Wm. O. Trevorrow, Jeddo-Highland Coal Co.; Frank W. Earnest Jr., Anthracite Institute; Richard Newbold, Lehigh Navigation Coal Co.; and, as alternate for Mr. Stephens, Wm. R. Dougan, Philadelphia & Reading Coal & Iron Co.

Higher Oil Prices Portends More Coal, Says Oil Paper

"Coal Competition—The recent advances by most Mid-Continent refiners in their tank car prices for No. 6 fuel, following the boost in crude prices, may cause them to lose a lot of their industrial oil business. Several large accounts are now maintaining that they can buy coal cheaper than they can oil. And some accounts have already cut back their No. 6 purchases in the Mid-Continent."

July 22 ***National Petroleum News***

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News Briefs and Trends

Price Becomes Member of Federal Safety Review Board

E. R. Price, representing coal operators, and Charles R. Ferguson, representing mine employees, were sworn in as members of the Federal Coal Mine Safety Board of Review Aug. 6. Mr. Price is manager of coal properties for the Inland Steel Co., Wheelwright, Ky., and Mr. Ferguson is safety director of the UMWA. Witnessing the ceremonies, held in the Board's Washington offices, were various representatives of the coal industry and government officials, including Felix Wormser, Assistant Secretary of the Interior in charge of mineral resources. As yet, the White House has not nominated a third member of the Board to represent the public. Troy L. Back is secretary of the Board and John S. Forsythe is general counsel.

Firm Wins $225,000 From UMWA; Pa. Injunctions Set

Nine temporary injunctions restraining the UMWA from interfering with the mining and transportation of coal from nine non-union stripping companies in Clearfield County, Pennsylvania, were put into effect permanently under an order signed July 23 by Judge F. Cortez Bell, of Clearfield County. Under the settlement, agreed to by attorneys for both sides, the union must pay all court costs of approximately $1,000. The injunctions covered the organizing efforts of the UMWA in the area over a period of nearly 2 yr. In the U. S. District Court at Abingdon, Va., the Laurel Branch Coal Co. was awarded $225,000 in damages from the UMWA and UMWA District 28 late in July. The non-union company had sought $300,000 damages

under provisions of the Taft-Hartley Act and alleged that a secondary boycott had forced it out of business. In its case, Laurel Branch stated that by a strike against the Clinchfield Coal Corp. in April, 1950, the union had forced Clinchfield to cancel its lease of coal land and the purchase of coal mined from the property, thus causing Laurel Branch to stop a profitable operation. The trial jury awarded $150,000 for actual damages and $75,000 in punitive damages on the allegation that the UMWA had wilfully destroyed Laurel Branch's business.

Fatalities Down in 1953; Anthracite Stops Haulage Deaths

Both the anthracite and bituminous industries showed improvement in fatality rates for the first 6 mo of 1953 as compared with 1952, and the anthracite industry set a new record by operating for a full 6 mo without a fatal haulage accident, USBM figures reveal.

From January through June, 1953, the bituminous industry had 189 fatalities, at a rate of 0.85 per million tons, compared with 243 fatalities in the same period of 1952 and a rate of 1.01. In anthracite, there were 38 fatalities in 1953, against 58 in 1952, at rates of 2.55 and 2.83, respectively. For the two industries combined, the rate of 0.95 for the first 6 mo of 1953 compares to the rate of 1.15 for the same period of 1952.

In commenting on the elimination of haulage fatalities in the anthracite region, J. J. Forbes, USBM director, said, "This record shows definitely that coal-mine accidents are not inevitable." Pointing out that for years haulage has been second only to falls of roof and face as the largest cause of fatalities, he cited accident-prevention training as important factor in achieving the record.

During the first half of 1952, underground and surface haulage caused 15 deaths at anthracite mines. While the anthracite industry had no fatalities in surface installations or strip mines during the 1953 period, and none resulting from haulage, explosives, electricity or machinery accidents, 29 men died as a result of falls of roof and face and 5 from local gas explosions, as compared with 24 and 4, respectively, in the same period of 1952. The bituminous industry showed a drop in its fatality rates for both roof falls and haulage during the 1953 period.

Coal Company Not Co-Employer With Lessees, Court Holds

A mining corporation which processed and sold coal produced by its lessees was not a co-employer with the lessees and was not responsible for alleged discrimination against employees who engaged in union activities, according to a recent ruling of the U. S. Court of Appeals for the Fourth Circuit in the case of the NLRB v Norma Mining Corp. The ruling reversed the stand of the NLRB, which had relied on the fact that the mining company paid the lessees a percentage of the selling price and could cancel the leases on 24-hr notice. The court, however, pointed out that each lessee had complete control over the hiring and firing, rates of pay and work of its em-

(Continued on page 174)

Sentinels of Safety Awarded Anthracite Mine

FOR TOP SAFETY HONORS in anthracite mining in 1952 won by the personnel of Hunter Tunnel mine of the Philadelphia & Reading Coal & Iron Co., Clarence, O. Whaite (right), Hunter Tunnel superintendent, receives the Sentinels of Safety Trophy and flag from Joseph I. Horty, managing editor, *Explosives Engineer* magazine. The awards were made at ceremonies Aug. 8 when the company played host to some 1,500 employees and friends at the Lakewood Park Pavilion. The presentation marked the second time Hunter Tunnel miners have won the trophy. As a part of the day's program, eight teams from P.&R. operations participated in the company's annual first aid contest, with the team of the St. Nicholas central breaker scoring 99.417 for first place. P.&R. conducted its first contest in first aid in 1904, George A. Roos, vice president, pointed out in his letter of welcome to those attending.

High Interest Marks Second Year of Truax-Traer Management Club

A TURNOUT averaging better than 80% of its members at every meeting to date is the achievement of the Truax-Traer Management Club, Kayford, W. Va., as it recently marked its second year of existence. The secret of the high attendance, club officials believe, are meeting programs carefully planned in advance. In fact, E. R. Templeton, club secretary reports, members have enjoyed the club so much that they have invited other companies who are not affiliated with the NAF to attend meetings to see the "NAF purpose" at work. At the meeting when the above photo of club officers and guests was taken, representatives of three companies not members of the NAF and two member companies were present.

Shown above are: Seated—Tom Holbrook (left), general manager, Anchor Coal Co.; Holcomb Jones, general manager, Carbon Fuel Co.; E. M. Cassidy, general manager, Truax-Traer Coal Co.; Robert Layman, vice president of the Kentucky Central Bank of Louisville, and guest speaker for the meeting; and Joe Cannon, club president. Standing—Tony Taucher (left), club board of control; Mr. Templeton; James Crewdson, American Viscose Corp.; J. C. Carter, Anchor Coal Co.; Clarence M. Schowen, American Viscose; Bill Bartlett, Armco Steel Corp.; Bill Cuthbert, club program chairman; Archie Hopkins, Armco Steel; A. V. Falle, general manager, Wyatt Coal Co.; and M. V. Reddnour, American Viscose.

Just a few hammer blows drive the wedge securely. This forces the bond terminal into intimate contact with the walls of the hole.

GET THE BEST ELECTRICAL CONTACT WITH THIS O-B Wedge Bond

Wedge Action Forces Metal-to-Metal Contact

Metal-to-metal contact—solid copper terminal against clean steel—makes the finest electrical connection for rail bonds. That's the connection O-B Wedge-Type Rail Bonds give you. Wedges exert a pressure of 20,000 pounds, forcing copper terminals against the clean walls of holes drilled in the rail. This intimate contact gives wedge type bond terminals a very low installed resistance.

The pressure that makes good electrical contact also creates a fine mechanical connection. Make no mistake about the holding power of the O-B Wedge-Type terminal! Because of it, wedge bonds are used for permanent joint bonding and cross-bonding on heavily traveled haulage. Even so, they are readily reclaimed. O-B Wedge-Type bonds often serve in as many as four or five successive applications.

Certainly this is the bond to use to make your bonding dollars go farthest. Have an O-B representative explain the simple installation method, and see how easily O-B Wedge Bonds will work into your haulage system!

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Personal Notes

W. C. Schott, general superintendent, Stonega Coke & Coal Co., Big Stone Gap, Va., has been promoted to general manager, effective Aug. 1. **S. H. Neeley Jr.** has been named manager of stores for the company at Stonega, Va. Mr. Neeley had managed the Andover Shopping Center at Andover, Va., operated by the company.

Franklin W. Peters, formerly assistant to the vice president—coal division in Pittsburgh, has been named assistant general superintendent, Frick district—coal division, United States Steel Co. **Wilbur L. Lohrentz** and **Edward C. Myers** have been appointed assistant vice presidents, industrial relations department. In the newly created positions, Mr. Myers will be associated with personnel and Mr. Lohrentz with labor relations.

Ralph A. Lambert, vice president and general manager, Pennsylvania Coal Co., has been elected president of the company, and of Northwestern Mining & Exchange Co. and The Blossburg Coal Co., succeeding **Harry J. Connolly,** named chairman of the board of directors. Mr. Connolly, who had been president since 1939, will continue to represent the company on industry committees. Mr. Lambert joined the Pennsylvania Coal Co. as assistant mining engineer in 1940.

James S. Laird, general superintendent, has been elected vice president, general manager and member of the board of directors for the Gay Coal & Coke Co., and Gay Mining Co., Mt. Gay, W. Va., succeeding the late **Harry S. Gay.** Prior to joining Gay Mining Co., Mr. Laird had been associated with Island Creek Coal Co. and Eastern Gas & Fuel Associates. **Moss Browning,** mine foreman at No. 3 mine, Gay Coal & Coke, has been named superintendent. **Fonzo E. Vincent,**

Tarleton Heads Consol (Ky.)

G. O. TARLETON was elected Aug. 21 president of the Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., succeeding S. M. Cassidy, who has been transferred to Pittsburgh as vice president of the parent company. Mr. Tarleton started with the operating department in 1928 and since July, 1946, has been vice president of the Kentucky division. He will continue to make his headquarters in Jenkins, Ky.

COAL MEN ON THE JOB . . .

KENTUCKY RIVER MINING INSTITUTE: Wilson Chafin, office manager, Meem-Haskins Coal Corp., Kodak, Ky., speaking at the institute's July meeting in Hazard, Ky. The four men closest to him on the same side of the table are (left to right): Ralph Jackson, preparation foreman, Leatherwood No. 1 mine, Blue Diamond Coal Co.; W. B. Wright, safety engineer, Leatherwood No. 1 mine; Ralph Bartlett, institute president, and general superintendent, Columbus Mining Co., Allais; Robert Dickson, institute secretary and safety director.

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● O-B Expansion Shells and Plugs are rust-proofed with a protective coat of No-Ox-Id dip. Think of what this means to you in terms of storage and easy use! Rust-proof O-B Shells and Plugs can be stored underground, or even outside, without damage. Plug threads stay smooth and open. Bearing surfaces between shells and plugs stay smooth and unpitted. Plugs always turn freely, and they slide on the inner surface of shells without galling or scoring.

The same rust-proof coating lubricates the shell and plug sliding surfaces, letting them slip freely as the bolt is tightened.

Rust-proof, lubricated O-B Shells and Plugs will work when you get ready to use them. Accurately cut threads, well protected with No-Ox-Id, never jam in the bolt thread. Don't let dirty, poor-fitting shells and plugs slow you down - order O-B's for all your bolting work. They go up fast and they stay put!

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The WANUCO PATENTED WATER NEUTRALIZING PROCESS ends acid water problems, which can be many. Through this effective method complete water systems are protected. Replacements of entire water lines, valves, fittings, screens and all conveyors are greatly reduced.

One coal mining company writes: "The first cost plus the operating cost of this neutralizing unit is VERY small in comparison to the savings in maintenance in our plant."

SEND YOUR WATER SAMPLES IN FOR TEST and OBTAIN OUR RECOMMENDATIONS, or LET US MAKE A SURVEY OF YOUR PROBLEM.

WATER NEUTRALIZING CO.

Henry O. Erb, Manager of Sales & Engineering

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superintendent for Gay Mining since 1941, will continue in charge of mining operations for that company. No changes in policy or personnel for either company is contemplated, Mr. Laird announced.

C. A. Perdue, superintendent of the Keystone mine, Coal Div., EG&FA, has been transferred to the Eccles operation as superintendent, succeeding **R. E. Mitchell,** retired. **Cleophus Short,** superintendent at Kopperston, has been transferred to Keystone, replacing Mr. Perdue, and has been replaced in turn by **William Laird,** formerly superintendent at Wharton No. 1 mine. **D. P. Shupe,** Carswell superintendent, has succeeded Mr. Laird as superintendent at Wharton No. 1. **E. H. Shaw,** production engineer, will serve as acting superintendent at Keystone until Mr. Short recovers from a recent accident and assumes his new post.

Harry A. Leidich, for many years head of the safety department of the Philadelphia & Reading Coal & Iron Co., recently retired from active service with the company. In recognition of the "great progress made under his splendid leadership," P. & R. dedicated its company-wide 1953 First Aid Contest "to his untiring efforts and to a continuation of the work so ably performed."

Lehigh Valley Coal Co., Wilkes-Barre, Pa., has announced several changes in personnel, following the recent suspension of operations of its Westmoreland and Franklin collieries. **George Collamer,** formerly superintendent at Franklin colliery, has been transferred to Snow Shoe in Center County to supervise the company's bituminous interests in that area. **Richard Miller,** superintendent at Westmoreland colliery, has been appointed superintendent at the Henry operation, succeeding **Herbert C. Kistler,** who has retired.

Prof. Harold L. Walker, head of the Department of Mining and Metallurgical Engineering at the University of Illinois, has resigned, effective Sept. 1, to become a partner in the M.&N. Engineering Co., at its branch in Taunton, Mass. The M.&N. Engineering Co., which Prof. Walker will serve as a consultant, is reconstructing the entire brass rolling mill of the New England Brass Co. and establishing new procedures for the manufacture of brass products. Mr. Walker came to the University of Illinois in 1938 as an assistant professor and has been a full professor and head of the department since 1942. During 1947 and 1949 he was granted leaves of absence to be interim director of the Illinois Department of Mine and Minerals.

George R. Beehler, assistant to the manager of mines, has been promoted to assistant to William W. Everett, vice president—operations, Glen Alden Coal Co., Wilkes-Barre, Pa. Associated with the company since 1922, Mr. Beehler has been active in the field of labor relations, having served on grievance committees for Glen Alden, and in addition has acted as a labor relations consultant to 40 anthracite companies.

O-B I-Beam Adapter Locates Trolley Hangers Accurately

Speeds Line Work, Too!

O-B I-Beam Adapter
With ⅝" stud: No. 21846
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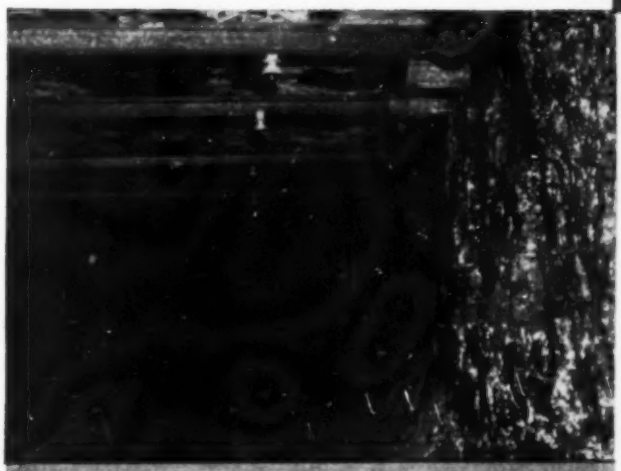

Just before stringing wire, held with O-B Bulldog Clamps, this illustration shows how hangers can be lined up with track. Collectors ride smoothly, swiftly, on neat, straight trolley wire.

Closer view of adapter, hanger, clamp and rubber wire guard.

● To attach trolley and feeder materials on I-beam supports quickly, you can't beat these O-B I-Beam Adapters. They line up nicely, too, making trolley wire run straight as a die! All kinds of line material work with this handy little clamp. Furnished with a ½" bolt, it holds any fitting with a tapped boss. Without the bolt, it holds clevises and strap-held accessories.

O-B Trolley and Feeder Materials work hand-in-hand with these adapters. The combinations — and the jobs you can do with them — justify your keeping a good stock on the shelves all the time. If you haven't worked with them before, let a trial order convince you that they're handy to have around!

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...ride a "JEEP"

The Lee-Norse TJ1 Mine Jeep gets you there safely! Here's the best answer for speedier underground transportation to and from working faces and emergency areas for mine superintendents, engineers, inspectors and maintenance personnel. A versatile performer the Lee-Norse Jeep can be used to pull man-trip cars, fire-fighting equipment and can be quickly placed in service as an ambulance. Detailed data available on request. Write now!

...ride a "SCOOTER"

No reason for mechanics, pumpers, fire bosses and other maintenance personnel to lose valuable time hitch-hiking when there is a Lee-Norse Scooter at hand. Weighing approximately 1000 lbs., the Scooter is popularly priced and its low-operating cost fits into every mine budget. The Scooter has a 48" wheelbase, is 9' in overall length and is available in all track gauges from 36" to 48". Where time is a factor the Lee-Norse Scooter is a "must". Send today for complete information and prices.

Lee-Norse Company
CHARLEROI, PA

C. E. Boyett recently retired after serving 28 of his 44 yr in the coal industry with the Peabody Coal Co. He has been serving as master mechanic and top foreman for the past 4 yr at Peabody's No. 43 mine, Harco, Ill., and has been in charge of the company's sludge-recovery plant there. During his career, Mr. Boyett developed various labor-saving devices used in all Peabody plants, such as a portable conveyor, a drill truck, a pattern for the recovery of sludge, and levees around sludge ponds to prevent flooding of private fields adjacent.

Clarence J. Dalzell has been named chief of the Johnstown, Pa., office of the U. S. Bureau of Mines. He had been serving as acting chief since March, when **Harry E. Sanford** resigned to join Wilmore Coal Co. as general superintendent.

Russell W. Decker, formerly sales manager with Fairmont Machinery Co., has joined the firm of Robinson & Robinson, consulting engineers, Charleston, W. Va., to manage the coal-preparation department. Mr. Decker was associated with Fairmont Machinery for 28 yr.

Merlynn Anderson, one of the 1953 winners of the Old Timers Club award, has joined the United States Fuel Co. as assistant engineer at the King mine.

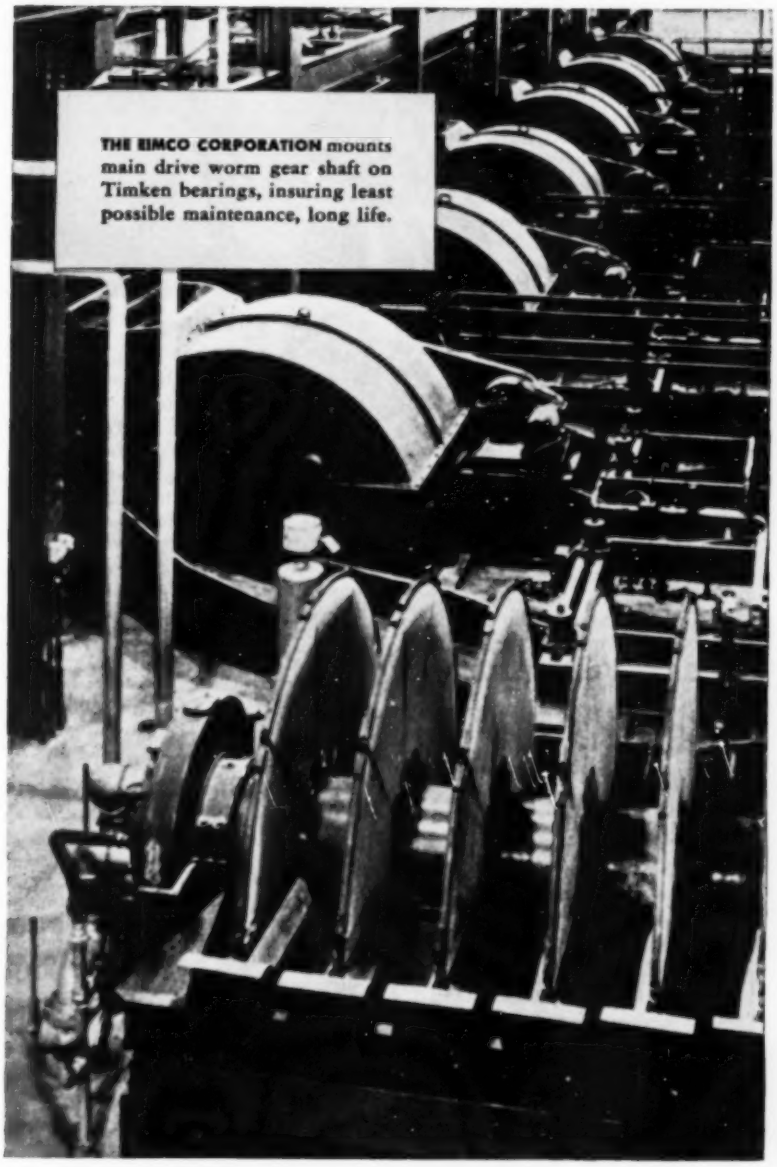
Obituaries

Erskine Ramsay, 88, mining engineer and inventor of over 40 coal-mining devices, died Aug. 15 in Birmingham, Ala. Superintendent of the H. C. Frick Coke Co.'s Monastery mines at the age of 19, Mr. Ramsay in turn was associated with the Morewood Coke Co., the South West Coal & Coke Co. and the Tennessee Coal, Iron & Railroad Co., for which he was chief engineer. In later years he became associated with the Alabama By-Products Corp., becoming chairman of the board. Perhaps his best known invention, which he never patented, was the shaking-screen process.

T. A. "Tad" Day, 51, former chief of the press and publicity section of Bituminous Coal Institute, Washington, D. C. died Aug. 21 following a heart attack while at the wheel of his car. With BCI since 1947, Mr. Day had just recently resigned to accept a position with the Cleveland Rock Drill Div. of the Le Roi Co. and had planned to move to Cleveland the following week. Widely known throughout the industry for his public relations and promotion activities, Mr. Day was associated with Appalachian Coals, Inc., Island Creek Coal Sales Co., and Bituminous Coal Research, Inc., before joining BCI.

John M. Marple, 37, superintendent, Widen mine, Elk River Coal & Lumber Co., Widen, W. Va., died July 23 in a Charleston, W. Va., hospital after a brief illness. Mr. Marple, who had just recently been promoted to mine superintendent after acting in that capacity for some time, had worked at the Widen mine for 18 yr.

Fishes profits out of coal washery waste water . . . *with help of TIMKEN® bearings*



THE EIMCO CORPORATION mounts main drive worm gear shaft on Timken bearings, insuring least possible maintenance, long life.

THE fines washed out of coal during processing—once considered too costly to recover—are turned into highly saleable "cake" by these Eimco filters. The installation shown is at the world's largest coal washing plant, a Jones & Laughlin operation.

Keeping the big collector discs constantly turning is a single worm gear drive, mounted on Timken® bearings. These bearings carry not only radial load, but the heavy thrust load of the worm as well. With Timken bearings' *tapered* design, no extra thrust bearings are required.

On this machine, Timken bearings are a sort of extra life insurance for the worm and worm gear. They hold the worm gear in precise and rigid alignment to assure accurate meshing. This, of course, minimizes gear wear, and helps save on maintenance.

Timken bearings themselves — because they're made of special alloy steels, manufactured with highest precision and finished to an incredible smoothness—normally last the life of the machinery they're installed in. Look for the trade-mark "Timken" on the bearings of any mining machinery you buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

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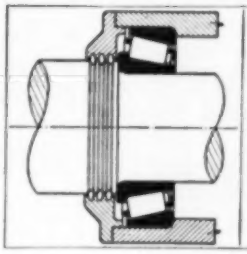
TAPERED ROLLER BEARINGS



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Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

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New Mine Developments

U. S. Steel Boosts Robena's Washed Output; Plans New Mine

Construction of a new addition to the present coal-cleaning plant to raise washing capacity to about 24,000 tons daily at its Robena mine was announced last month by the U. S. Steel Corp. At the same time, it was reported that U. S. Steel plans to open another mine in Greene County, Pennsylvania, in the vicinity of Rice's Landing, scheduled to begin operation in 1955. When fully developed the mine will produce 20,000 tons daily and will have a complete new washing plant. The new 10-story addition to the Robena plant is expected to be in full operation by the end of this year and will permit a 50% increase in Robena's washed-coal shipments to the company's Clairton by-product coke works. When completed, the washer will produce the highest quality of metallurgical coal and is expected to operate on a 24-hr basis 5 days a week, John Durfee, plant superintendent, reported.

Railroad Spur to Open New West Virginia Coal Field

A 12-mi track extension to permit new development of a West Virginia coal field with reserves estimated at 85 million tons is under construction by the Nicholas, Fayette & Greenbrier R.R., jointly owned by the N. Y. Central R.R. and the Chesapeake & Ohio Ry., it was reported Aug. 17. The new track, which will require heavy grading through mountainous territory and will cost several million dollars, will extend from the N.F.&G. line near Russellville, W. Va., south to Landisburg, W. Va. Much of the coal in the area is of metallurgical-coking grade and it is estimated that output from the field will reach an average of 1,000,000 tons annually within 5 yr after completion of the extension, scheduled for the middle of 1954. Coal tipples of the Royalty Smokeless Coal Co., a subsidiary of the A. T. Massey Coal Co., Inc., will be located on the new track and it also is expected that the Maryland New River Coal Co. will begin operations along the line. Strip mining has been carried on in the area for some years, but two deep-mine shafts are now in and others are planned.

3 Mi of Belting to Texas

PART of the 28,000 ft of 42-in conveyor belting made by the Goodyear Tire & Rubber Co. for a new lignite mining development in Texas being loaded for shipment. To facilitate installation, the belting is transported in 14 rolls of 2,000 ft, each weighing 25,000 lb. It will be followed by 7,000 ft of 36-in belting to complete an eight-flight system more than 3 mi long which will carry lignite from a new strip-mining field to a power plant being built near Rockdale, Tex., to power a new plant of the Aluminum Corp. of America. Constructed of a specially compounded cold rubber and fabric, the belts will have a top capacity of 1,000 tph at a speed of 550 fpm and will utilize eight motors with a total of 950 hp.

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- Model 444 4-Wheel-Drive 4-Wheel-Steer Tractor.
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W. Va. Coal & Coke Corp. To Enter Ohio

Extension of its mining operations into southeastern Ohio, where it has already optioned 3,162 acres in Gallia County and purchased 1,500 acres in Lawrence

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Keen judgement can save you a peck of trouble when it comes to picking the right line of lubricants . . . and top mining men, throughout the country, with a keen eye for increased production and fewer machinery repairs, have chosen the complete Cities Service line. Find out about the super-performance of Cities Service Lubricants and take advantage of the free services of an expert Cities Service Lubrication Engineer. Write Cities Service Oil Company, Dept. 1-5, Sixty Wall Tower, New York 5, New York.

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NEW POWER CONTROL UNIT

Be sure to see the all-new Baker PCU-75 . . . featuring a Multiple-Disc Clutch with higher capacity—3-Way Adjustable Hand Levers—faster, more rugged brakes with single-point adjustment.

Tough Blade

you won't drive thru

Fingertip Control

you don't have to fight

Easy Tilting

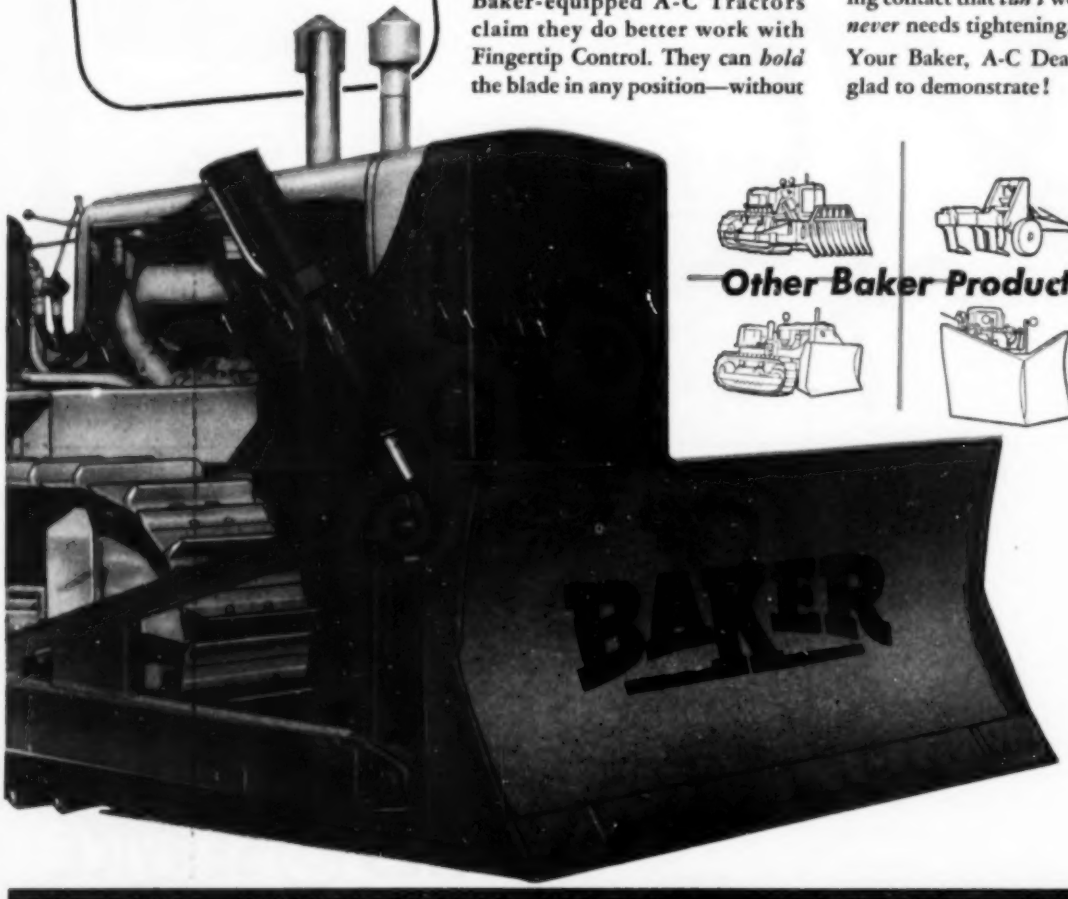
you don't have to tighten

Tough Blade—Baker Bulldozers and Gradebuilders feature construction of tougher steel with greater wear resistance. That's why they last longer . . . why operators say "you won't drive through a Baker Blade!"

Fingertip Control—Operators of Baker-equipped A-C Tractors claim they do better work with Fingertip Control. They can *hold* the blade in any position—without settle or "suck-in". Responsive to lightest hand-pressures, the Baker Fingertip Control is one *you don't have to fight.*

Easy Tilting—Two quick-shift pins at the trunnion brackets permit full arc-movement, up to 12" in five positions . . . with full-bearing contact that *can't* work loose—*never* needs tightening.

Your Baker, A-C Dealer will be glad to demonstrate!



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Lehigh Navigation Fetes 200 Company Veterans

GLENN O. KIDD (right), newly elected president of the Lehigh Navigation Coal Co., Inc., visits with two members of the "Old Timers Club," restricted to mineworkers who have been employed by the company at least 50 yr, at the 11th annual meeting of the group held Aug. 8. William W. Bobst (center), 90, champion oldster in attendance, worked 68 yr for the company and has been on pension since 1941. His son Richard (left), now 69, had 52 yr of service before retiring. Expressing his confidence in the future of the industry, Mr. Kidd told the Old Company veterans: "I'm looking forward to the year 1991, when I can step up and get my own Old Timer's pin. I believe that we can mine and sell more coal, and that the Old Company will be a leader for as many years as we can see ahead." As in past years, a welcome feature of the outing was a hearty lunch served by the "top brass" of the company, led by Mr. Kidd, garbed in chef's caps and aprons.

County for coal stripping, has been announced by the West Virginia Coal & Coke Corp. Most of the coal mined probably will go to the Gallia County generating plant under construction to power the AEC's new Ohio plant. A preliminary survey shows the acreage has about 20 million tons of coal available for mining, the company reports. A tentative site for a loading dock on the Ohio River has been selected near Crown City, Gallia County.

TVA Makes New Coal Contracts

The Tennessee Valley Authority recently reported placing of contracts for 2,418,000 tons of coal costing $10,773,932 for its Widow Creek generating plant in northeast Alabama. According to reports, suppliers, total tonnages and prices under the contracts were: Tennessee Products & Chemical Corp., Nashville, 1,742,000 tons at $4.308 to $5 a ton;

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Machine and Motor Repair Shop

Here's a Single Answer to Your Building Problems

These four structures illustrate only a few of the many applications of Armco Steel Buildings for coal mines. Many economy-minded operators have found them to be the safe, efficient answer to their building problems.

With Armco Steel Buildings, unique STEELOX construction provides both outside surface and structural support in a single unit. This simplifies construction. And the entire job can be handled by your own crew or any local contractor in a matter of hours. Labor costs are low.

Also important, these buildings remain weathertight year after year. They are noncombustible and lightning-proof when properly grounded. Armco Buildings have all the features of any permanent structure plus the added advantage that if desirable they can be dismantled and re-erected on a new site without loss of material.

With the wide range of sizes and types of Armco Buildings it is easy to find the right one for every coal mining application. Write for details. Armco Drainage & Metal Products, Inc., 1723 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

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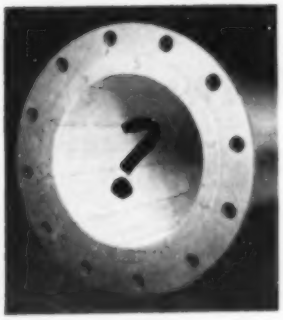

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- ✓ high pressure rating

(Up to 400 p.s.i. or higher for special applications)

If you expect the mine pipe you buy to answer these needs . . . and more . . . YOU WANT MPC WOOD-LINED STEEL PIPE!

Typical installations of MPC Wood-Lined Steel Pipe are now successfully handling 25% silica slurries (16 f.p.s. @ 150 p.s.i.) with the expected advantages of economy and dependability. Keep these advantages in mind for your next purchase of mine pipe!

Wood-lined fittings in standard and special designs for all diameters. For catalog and additional information, write Dept. CA.

MPC MICHIGAN PIPE COMPANY
Bay City, Michigan

Manufacturers of Wood-Lined Steel, Saran Rubber-Lined Steel, Stainless Steel and Monel Piping. Represented nationally by Saran Lined Pipe Co. Detroit, (Ferndale) Michigan.

Mine Rescue Group Holds Second Meeting

OFFICERS AND SPEAKERS at the second meeting of the Fred J. Bailey Post No. 4, National Mine Rescue Association, held June 19 at the Benton (Ill.) Country Club included: Eugene Mauck (left), general superintendent, Olga Coal Co., Coalwood, W. Va.; Coy L. South, USBM inspector and Post secretary-treasurer; E. E. Quenon, chief, Vincennes (Ind.) branch, Accident Prevention and Health Div., USBM; C. M. Walker, safety director, Chicago, Wilmington & Franklin Coal Corp., and Post president; and James Phalan, assistant chief, Kentucky Department of Mines & Minerals. Attending the meeting were 111 members of the post. John J. Lyons, recently retired safety engineer of the Bell & Zoller Coal & Mining Co., was made an honorary member of the association in recognition of his services to mining safety. Messers. Mauck, Quenon and Phalan were the principle speakers at the afternoon session and Ross Shannon, Socony Vacuum Oil Co., St. Louis, was toastmaster at the banquet.

"W" DENTED SHAKER SCREENS

A "must" when it comes to obtaining an efficient job! *Good* because the spreading and collecting riffles give uniform spread of material over the entire screen surface . . turns the top and middle flow of material down in direct contact with the screen . . . gives an increased screening efficiency up to 33% on fine sizes over an undented flat screen.

Comes in Carbon and Stainless Steels and Manganese Bronze. No sag.

Write us today. We shall reply promptly.

REMALY MANUFACTURING CO., INC.
TAMAQUA, PA.

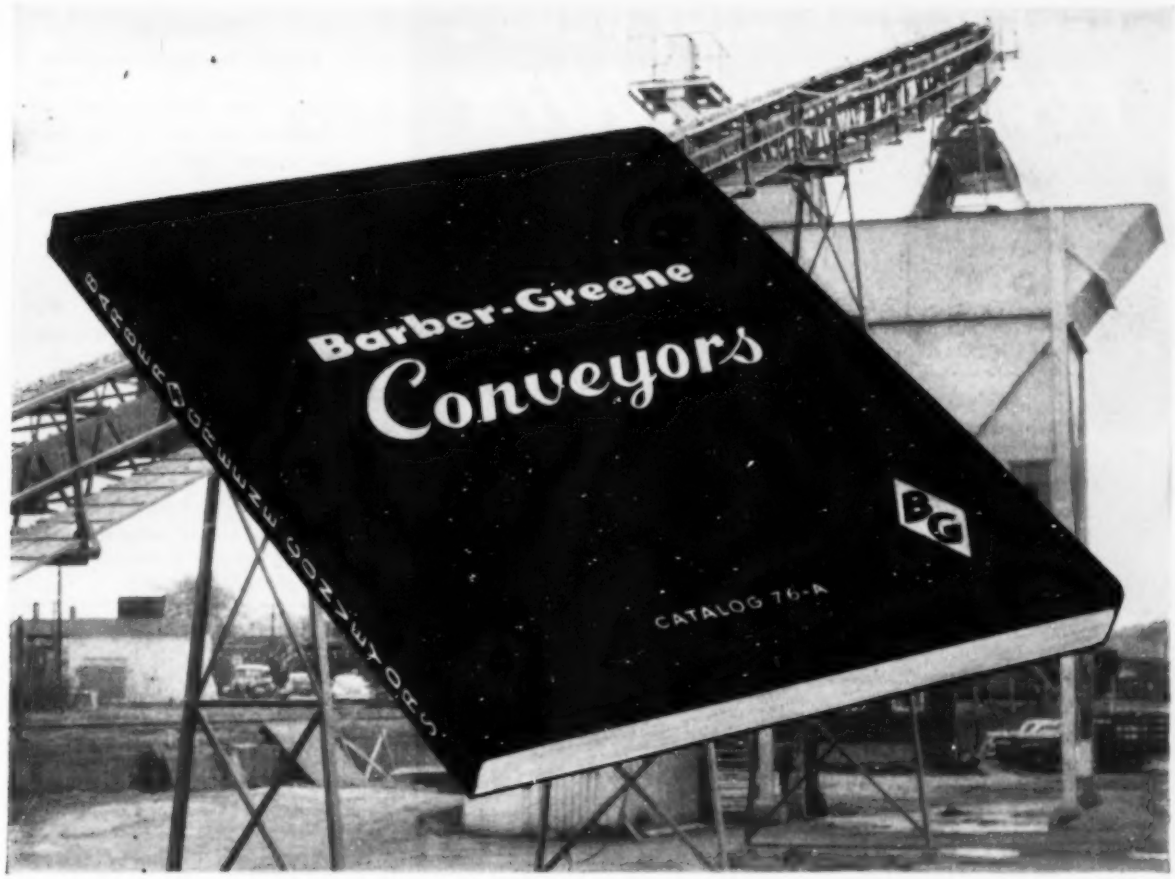
Tennessee Consolidated Coal Co., Tracy City, Tenn., 156,000 tons at $3.85 to $4 a ton; Whitewell Coal Corp., Tracy City, 208,000 tons at $4.18 a ton; Camp Coal Co., 52,000 tons at $4 a ton; Plateau Coal Co., Chattanooga, 104,000 tons at $3.80 a ton; and Baugh Mines, Huntsville, Ala., 156,000 tons at $4.75 a ton.

New 1,500-TPD Stripping Opens

B. H. Swaney, Inc., Clarksburg, W. Va., last month began loading coal from its new Erie No. 5 strip mine near Walkersville, W. Va., shipping via the B. & O. R.R. The property is mining the Redstone seam and is developing to a capacity of 1,500 tons of sized coal daily. A tipple is now being built and preparation equipment to be installed will include a crusher, screens, picking table and oil treating. United Eastern Coal Sales, New York, is sales agent for the operation.

Pa. Coal & Coke Purchases Insulated-Wire Manufacturers

As another move in its current program to expand and diversify its business, the Pennsylvania Coal & Coke Corp. last month announced the acquisition as wholly owned subsidiaries of the Crescent Company, Inc., and Properties, Inc., Pawtucket, R. I. The companies are manufacturers of insulated copper wire for the automotive and electrical fields and have a reported net worth of $2,000,000. L. D. Silberstein, president and



If You Handle Bulk Materials You Will Want This New Catalog!

Here's the Most Complete, Comprehensive, Easy-to-Use Conveyor Catalog Ever Published!

Clearly presented in this 192-page book is the broad selection of standardized drives, take-ups, truss, idlers, belting . . . all the components and accessories required to fit your requirements. There are more than 60 pages of typical conveyor layouts and installation photographs. Also included is a section on shuttle conveyors, stackers, feeders and portables.

This catalog clearly and factually demonstrates the savings in design, delivery time, erection and operating costs that Barber-Greene standardization makes possible. Once you use it, you'll have a new conception of the economy, utility and simplicity of Barber-Greene Standardized Conveyors.

WRITE FOR YOUR COPY

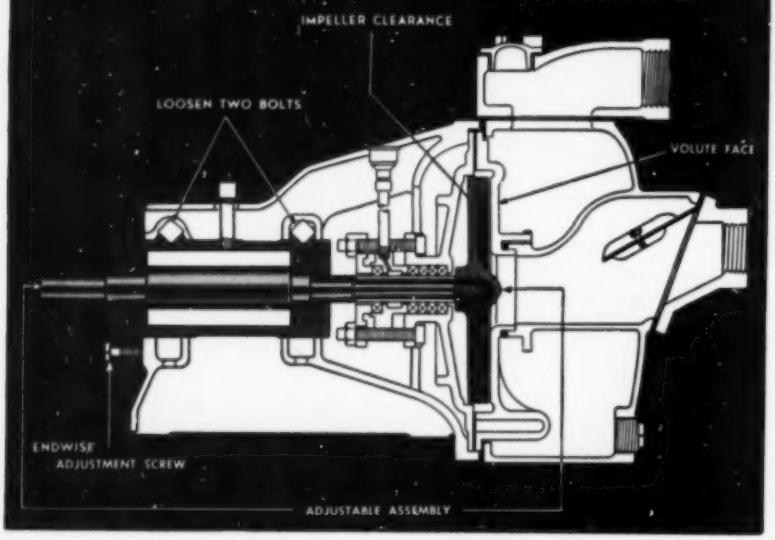
If you handle bulk materials, you'll want this new catalog. Please request Catalog 76-A on your company letterhead.

53-20A-PE

Barber-Greene BG

Aurora, Illinois, U.S.A.

HERE IS THIS MINE PUMP'S FOUNTAIN of YOUTH



RENEWS THE PUMP TO BRAND NEW PERFORMANCE IN ONLY A FEW MOMENTS!

Gorman-Rupp pumps are noted for their **high pumping efficiency** and their **long trouble-free service.**

In any pump, however, under the gruelling requirements of mine service and acidity of mine water, certain parts are subject to wear.

The point most affected by these conditions is the clearance between the impeller face and the volute face. Due to wear this clearance increases, resulting in loss of head and capacity.

THE ANSWER IS SIMPLE WITH A GORMAN-RUPP

Loosen two bolts and move the entire Adjustable Assembly forward (see illustration) by means of the endwise adjustment screw. This reduces the impeller clearance to normal and — **THE PUMP PERFORMS LIKE NEW.**

Gorman-Rupp pumps save money in mine operations and require very little headroom. ***Ask for Bulletin O-ME-11***

DISTRIBUTED BY

Auto Machine Company, Marion, Illinois
Athens Armature and Machine Co., Athens, Ohio
The Bittenbender Co., Scranton, Pa.
Buckeye Machine Supply Co., New Philadelphia, Ohio
Bluefield Supply Co., Bluefield, W. Va.
Cambridge Mach. & Supply Co., Cambridge, Ohio
Central Mine Supply Co., Mt. Vernon, Illinois
Central Mine Supply Co., Madisonville, Ky.
Greenville Supply Co., Greenville, Ky.
General Machinery Co., Birmingham, Alabama
Guyan Machinery Co., Logan, W. Va.
Hoe Supply Co., Christopher, Illinois
Industrial Supply Co., Terre Haute, Indiana
Jackson Implement Co., Jackson, Ohio
Johns Equipment Co., Ft. Wayne, Indiana
McComb Supply Co., Harlan, Ky.
Mine Service Co., Lothair, Ky.
Reliable Electric & Equip. Co., Zanesville, Ohio
Superior Sterling Co., Bluefield, W. Va.
Tennessee Mill & Mine Supply Co., Knoxville, Tenn.
West Virginia Pump & Supply Co., Huntington, W. Va.
Weinman Pump & Supply Co., Pittsburgh, Pa.

THE GORMAN-RUPP COMPANY
306 BOWMAN STREET, MANSFIELD, OHIO

Meetings

Mineral Producers' Association: Annual Meeting Sept. 17, Hotel Willliam Penn, Pittsburgh, Pa.

National First Aid and Mine Rescue Contest, Sept 30-Oct. 2 Fort Wayne, Ind.

Coal Exporters' Association of the United States, Inc.: Annual Convention, Oct. 19, Shoreham Hotel, Washington, D. C.

National Coal Association: 1953 convention, Oct. 19-21, Shoreham Hotel, Washington, D. C.

National Safety Council: Annual convention and exposition, Oct. 19-23, Conrad Hilton Hotel, Chicago, Ill.

Illinois Mining Institute: 61st Annual Meeting, Nov. 6, Hotel Abraham Lincoln, Springfield, Ill.

Kentucky Mining Institute: Annual meeting Nov. 12-13, Phoenix Hotel, Lexington, Ky.

chairman of the board of Pennsylvania Coal & Coke, will act as chairman of the boards of the new subsidiaries. The company's program calls for still further expansion, Mr. Silberstein said. In the past 2 yr it has acquired interests in shipping, oil and heavy equipment manufacturing, including control of the Industrial Brownhoist Corp. announced in July.

Pennsylvania Property Leased

Underground rights to some 2,000 acres of coal lands near Climax, Indiana County, Pennsylvania, have been leased by George O. Ragner & Associates, Pittsburgh, which reportedly is planning extensive development. The acreage was leased from W. W. MaQuilken, Johnstown, Pa., who will continue his stripping operations in the area. Involved is the property of the Garfield Fuel Co. and adjacent lands, including 50 surface acres to provide access.

Preparation Facilities

Penag Coal Co., Good Springs, Pa.—Contract closed with Wilmot Engineering Co. for one Type D Wilmot Simplex jig to prepare nut coal at 20 tph.

Glen Alden Coal Co., Woodward Colliery, Kingston, Pa.—Contract closed with Wilmot Engineering Co. for one 8-ft-diameter Wilmot Hydrotator to prepare No. 4 coal at 80 tph, and two 12-ft-diameter Wilmot Hydrotator-classifiers for preparing No. 5 coal at total feed capacity of 100 tph.

Schneck Coal Co., Suedburg, Pa.—Contract closed with Wilmot Engineering Co. for one 2½-ft diameter Wilmot Hydrotator for preparing Buckwheat No. 1 coal at 18 tph.

Pocahontas Fuel Co., Inc., No. 31 colliery, Amonate, Va.—Shipment by Deister Concentrator Co. of eight No. 7 Super-

ARE YOU SENDING YOUR FINES...

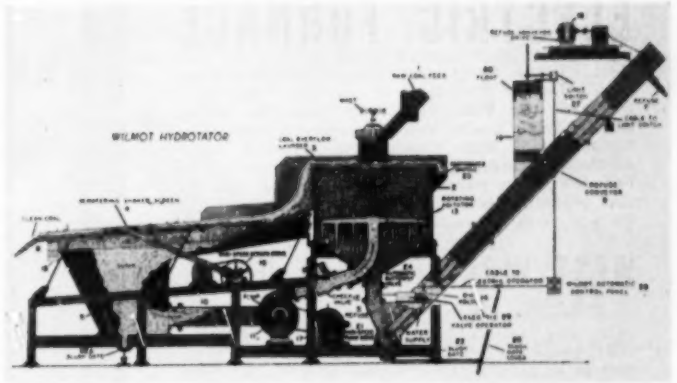
INTO DISCARD?...

OR TO MARKET?...

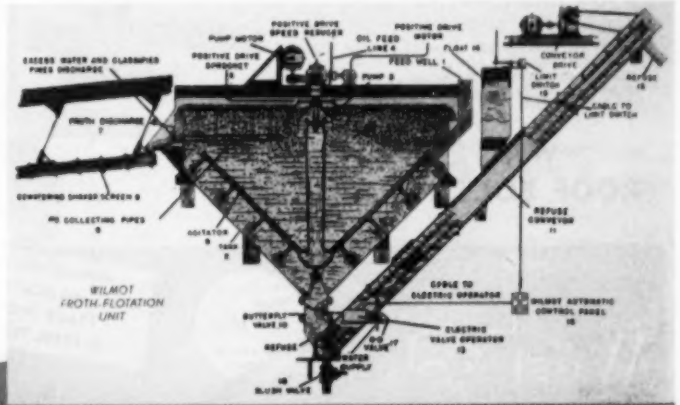
Wilmot Automatic Recovery System produces profits from fines 2 ways

The Wilmot system for recovering coal fines is enabling an increasing number of operators to use these two possible sources of carry-over to profits: (1) Saving in refuse disposal cost; (2) Sale of fines.

The Wilmot system is entirely flexible in application, employing: Wilmot Hydrotators to recover all specified sizes down to +3/64" mesh; and Wilmot froth-flotation units to complete recovery down to +0 mesh, if desired. These Wilmot units feature automatic controls which have effected remarkable increases in the ratio between yield and labor costs. We invite you to see how this near approach to "push button" operation is making it practical and profitable to recover the fine sizes.



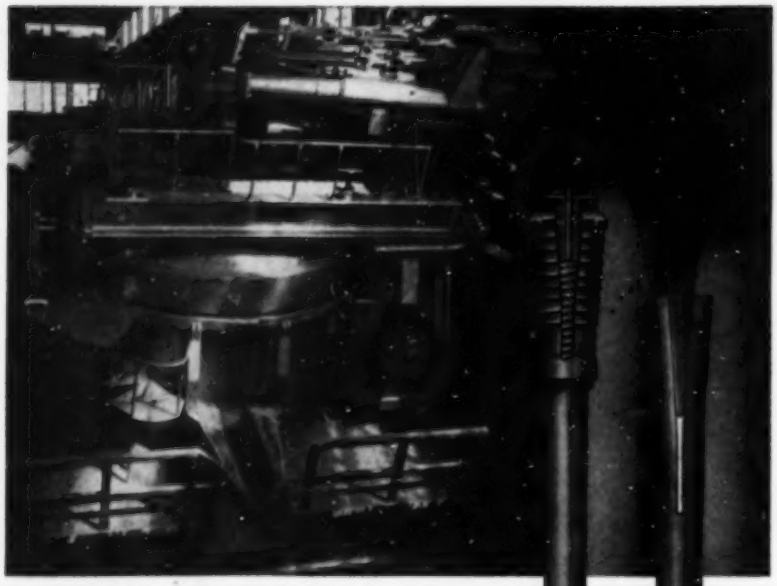
Above, Wilmot Hydrotator coal cleaner; below, Wilmot froth-flotation unit. Both have automatic controls, with visible-audible signals. For all sizes of plants. Also heavy-media units for larger sizes of coal.



Send for
BULLETIN H-511
on Coal Cleaning

WILMOT ENGINEERING CO.

HAZLETON, PA.
Plant:
WHITE HAVEN, PA.



WEST VIRGINIA'S NEW ELECTRIC FURNACE

West Virginia Steel's giant new, multi-million-dollar electric furnace is evidence of the steps being taken continually by West Virginia to bring the mining industry better quality steel products—trackwork, ties, turnouts, rail, West Virginia roof bolts—for lower maintenance costs, higher economy and greater safety. For *now*, when you specify *West Virginia*, you get steel products *quality controlled* through every step of the way, from raw material to finished product.

WEST VIRGINIA ROOF BOLTS

As an example, West Virginia roof bolts and expansion units, long accepted for safety, economy, dependability and easy, low-cost installation, are now being used in an ever-increasing number of mines for better roof support and freer passageways for haulage and ventilation. Timbering is eliminated. Available in both wedge and expansion sleeve types, complete with all accessories—not "assembly jobs", but manufactured from start to finish from first quality specification steel in West Virginia Steel's modern plant.

Write for information about how West Virginia roof bolts—or any other West Virginia product—can lower your operating costs while giving you at the same time greater efficiency and greater safety.

WRITE FOR NEW ROOF BOLTING BULLETIN

EQUIPMENT APPROVALS

Seven approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Jeffrey Mfg. Co.—Shortwall truck; one 7½-hp motor, 550 v, DC; Approval 2-775A; July 28.

Goodman Mfg. Co.—Type 865-B tractor-tread loader; two 10-hp and two 20-hp motors, 500 v, DC; Approval 2-876A; July 7.

Joy Mfg. Co.—Type 10SC-2PE/PXE cable-reel shuttle cars; two 5-hp and three 10-hp motors, 250 v, DC; Approval 2-917; July 3.

Ensign Electric & Mfg. Co.—Bulletin 2025 mining machine (coal planer); three 50-hp motors, 440 v, AC; Approval 2-945A; July 13.

Joy Mfg. Co.—Type 6SC5BPE/BPXE-2 cable-reel shuttle cars; two 10-hp and one 7½-hp motors, 250 v, DC; Approval 2-946; July 17.

Joy Mfg. Co.—Type WL80B Model 40 air compressor; one 40-hp motor, 220 v, AC; Approval 2-947; July 21.

Joy Mfg. Co.—Type 10SC1PE/PXE-1 cable-reel shuttle cars; three 10-hp and two 5-hp motors, 250 v, DC; Approval 2-948; July 30.

Duty Diagonal-Deck coal-washing tables and three Model 108-B Concenco revolving feed distributors.

Republic Steel Corp., Spaulding Mines, Spaulding, Ala.—Shipment by Deister Concentrator Co. of one No. 7 Super-Duty Diagonal-Deck coal washing table.

Blue Diamond Coal Co., Leatherwood No. 2 mine, Tilford, Ky.—Contract closed with McNally Pittsburg Mfg. Corp. for complete 400-tph dense-media cleaning plant with the following facilities: McNally rotary breaker reducing R-O-M to 14x0 at 400 tph; prescreening broken R-O-M at 2 and ¼ in; 14x2 raw coal washed in McNally Tromp dense media cleaning unit and 2x¼ raw coal washed in McNally Tromp fine-coal bath; ¼x0 deslimed raw coal cleaned on Deister concentrating tables; complete crushing plant and rescreening facilities provided with thermal drying of all 1¼-in minus washed coals; water circuit closed by vacuum filters and thickeners.

Jewell Ridge Coal Corp., Blair Fork mine, Delphia, Ky.—Contract closed with McNally Pittsburg Mfg. Corp. for McNally-Norton unit washer addition treating 5x2 raw coal at 76 tph, classifying washed coals into 5x3 and 3x2, complete with water-handling facilities and alterations to present preparation plant.

Eastern Gas & Fuel Associates, Wharton No. 2 mine, Wharton, W. Va.—Contract closed with McNally Pittsburg Mfg. Corp. for one 6-cell McNally-Norton wash box supplementing equipment furnished by Kanawha Mfg. Co., treating 5x0 at 300 tph.

CUT WHEEL REPLACEMENT COSTS AT LEAST- 56%

with the revolutionary sterling plan

No additional capital outlay necessary!

Alert mine operators are always searching for new ways, new methods to reduce overhead and operating costs. One way they've found is to follow the STERLING Plan. For example, without spending a dollar more, you can re-wheel with STERLING cast steel wheels and save *at least 56 per cent in wheel replacement costs!*

STERLING cast steel wheels have uniformity of hardness *throughout*. In fact, they work-harden with each trip. This means less expensive, safer, more dependable transportation. STERLING cast steel wheels are precision balanced, and they *stay* in balance, preventing worn spots, eliminating load vibration. The STERLING Plan shows how *you* can cut operating costs substantially. Write for your copy of the STERLING Plan, today!

This new cast steel mine wheel reduces down-time losses, cuts repair labor costs!

SAFER •
STRONGER •
MUCH LONGER WEAR •
COSTS LESS—*in the long run!* •

THE sterling PLAN *will show you how much you will save!*

sterling
STEEL CASTING COMPANY
EAST ST. LOUIS • ILLINOIS

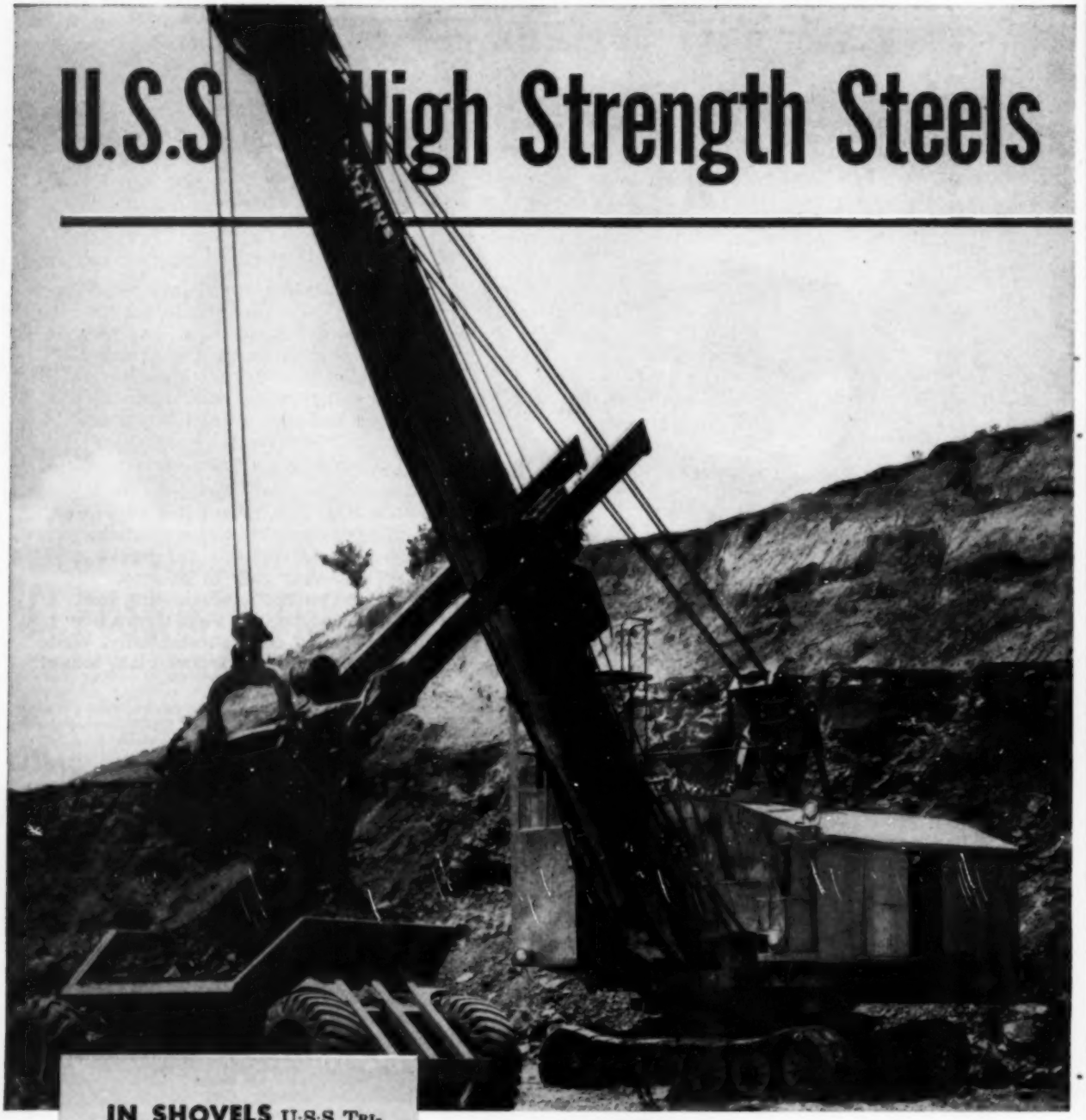
Gentlemen:
Of course I want to cut my wheel replacement costs. Send me the STERLING Plan right away. (No obligation, of course.)

Name_____
Title_____
Company_____
Address_____
City_____ State_____
No. of mine cars now in use_____

REPRESENTATIVES
Amos A. Culp, 930 Second Ave., North — BIRMINGHAM 4, ALA.
Marshall Equipment Co., 1042 Enslow Blvd. — HUNTINGTON, W. VA.
R. A. Thompson, Hotel Madison — MADISONVILLE, KY.
J. E. Hauser, 720 Beaufort Ave., Mt. Lebanon — PITTSBURGH, PA.
Western Sales Engr. Co., 370 S. West Temple St. — SALT LAKE CITY, UTAH
[illegible] Supply Co., James Squib, Hawley Building — WHEELING, W. VA.

Mail this coupon today!

U.S.S High Strength Steels



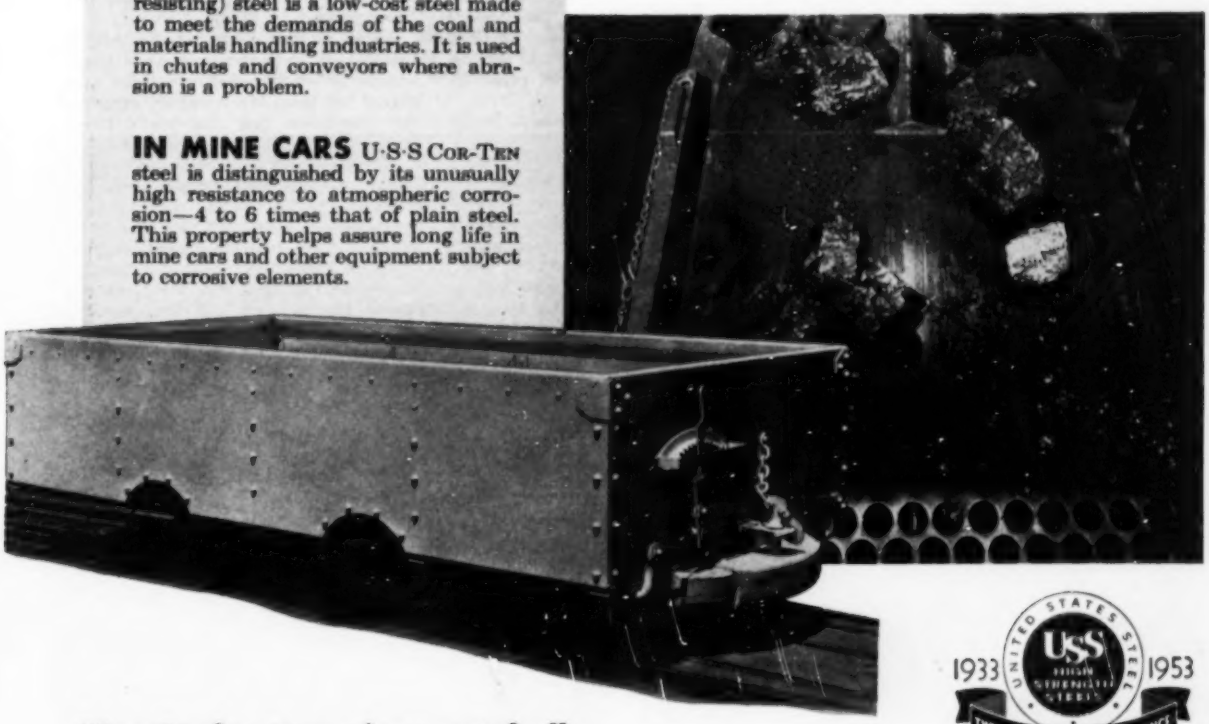
IN SHOVELS U·S·S TRI-TEN is a tough, versatile steel that is noted for its ability to withstand shock at sub-zero temperatures. It has good welding qualities and is often used in large booms, buckets and draglines.

IN TRUCKS U·S·S MAN-TEN is a low-cost manganese-copper steel made for applications requiring high strength, toughness and good workability.

save money, time, and work!

IN CHUTES U·S·S A-R (abrasion-resisting) steel is a low-cost steel made to meet the demands of the coal and materials handling industries. It is used in chutes and conveyors where abrasion is a problem.

IN MINE CARS U·S·S COR-TEN steel is distinguished by its unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel. This property helps assure long life in mine cars and other equipment subject to corrosive elements.



1933 USS HIGH STRENGTH STEELS 1953
UNITED STATES STEEL
TWENTY YEARS OF PERFORMANCE

Here's the story in a nutshell

U·S·S MAN-TEN and U·S·S TRI-TEN steels have a yield point 50% higher than that of ordinary steel. Parts ordinarily prone to failure can be made highly resistant to wear, fatigue and shock. U·S·S COR-TEN steel, in addition to having these same properties, offers resistance to atmospheric corrosion. And, U·S·S A-R steel can give maximum resistance to abrasion.

This means you get maximum durability in your equipment and therefore maximum use.

You save the *work* of frequent repair jobs, you save the *time* lost by frequent breakdowns, and you save the *money* spent for frequent parts replacement.

Because U·S·S High Strength Steels have 50% higher yield point you can increase the strength of parts *without increasing their weight*. Or, you can use these steels in lighter sections and *reduce weight* without reducing the present strength of your equipment.

These famous "steels that do more" have been used by the mining industry for almost 20 years. Our engineers will be glad to show you how they can be used to add strength and durability to your equipment.

Phone or write our nearest office today.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S HIGH STRENGTH STEELS

USS

UNITED STATES STEEL

Lehigh Navigation Unveils Dealer's Dream Package

Lehigh Navigation Coal Co., Philadelphia and Lansford, Pa., disclosed Aug. 13 its new "Dealer's Dream Package" for the 1953 fall and winter season.

The new plan provides a choice of four payment plans for dealers, offers August prices throughout the burning season for all sizes except buckwheat and pea, eliminates interest and carrying charges from all credit options and promises a substantial return on money paid in advance. Details of the plan were announced by Richard C. Newbold, LNC director of sales, at a company sales meeting at Philadelphia.

For anthracite dealers who accept the plan, coal will be shipped through the burning season as it is needed until March 31, 1954, coal being stored at the mine without cost to the dealer. Prices are guaranteed at August levels unless an increase in miners' wages or other benefits forces an increase. In that event, only the amount of the increase will be added, distributed appropriately among the several sizes of anthracite produced.

For dealers who take all the coal they sign up for, LNC will increase its share of the dealer advertising allowance to 25c per ton for a spring advertising campaign to be launched at the dealer's request in April, May or June, provided the dealer puts up his usual 10c per ton.

The four optional payment plans are as follows:

1. Six equal monthly payments beginning Oct. 1, 1953.

2. Payment following sales – that is, the dealer reports monthly the tonnage sold and remits accordingly.

3. Payment for each shipment within 15 days, with benefit of the regular cash discount.

4. Payment in advance, with interest at 4% payable to the dealer from the agreement date until March 31, 1954, plus the usual cash discount.

Under all four plans, LNC will finance freight charges and pay them in advance if the dealer requests.

To develop the "Dealer's Dream Package," LNC salesmen asked dealers what they wanted and what they objected to in existing plans. Putting all the answers together, the company took the requirements for the new sales effort to the credit and legal departments and directed them to find ways to make dealers' wishes come true. The result is "a part of our plan to give dealers every bit of help and service we possibly can," Mr. Newbold said.

Noting in the course of the meeting that Lehigh Navigation sales as of Aug. 1 were only 133,000 tons behind the same period last year, Mr. Newbold expressed the conviction that the year's results would show an increase over 1952.

Mr. Newbold also reported on the company's plan for moving a backlog of chestnut coal by offering such things as refrigerators, home freezers and radio-phonographs free to dealers ordering chestnut before Aug. 15 for immediate shipment. The offer was for 1 wk only and in the first days 750 cars were sold, and Mr. Newbold reported that the company probably would have to withdraw the offer before the week was up.

Among the Manufacturers

Dodge Mfg. Marks 75 Yr of Growth

ITS 75TH ANNIVERSARY in the manufacture of power-transmission machinery was celebrated in June by the Dodge Mfg. Corp., Mishawaka, Ind., with a series of community and plant ceremonies. A highlight of the program was a civic testimonial luncheon at which a bronze plaque was presented, on behalf of the City of Mishawaka, by Mayor E. Spencer Walton to Joseph E. Otis Jr. (center, left photo), as four former Mishawaka mayors look on. Based on a formal resolution adopted by the City Council, the plaque commended the company for "three-quarters of a century of industrial progress and civic achievement" in its home city. Another feature of the celebration was an Open House (right photo) during which more than 3,200 guests, including families of employees and friends, were taken on guided tours of the plant. Since Wallace Dodge began the company in June, 1878, with his "Magic wagon jack," Dodge Mfg. Corp. has grown from one product to some 6,000, from a dozen workers to more than 1,000, and from an original capitalization of $50,000 to a net worth of over $5½ million.

Hercules Powder Co., Wilmington, Del., has elected J. B. Johnson, general manager, explosives department since 1945, a vice president and a member of the executive committee. John M. Martin, assistant general manager of the department, has been appointed general manager, succeeding Mr. Johnson. William R. Ellis, who resigned as a member of the executive committee, continues as a vice president and director of the company. LeRoy Keane, director of sales, and Harry V. Chase, director of operations, explosives department, have been named assistant general managers of the department. Mr. Keane has been director of sales for the department since 1945, and has been associated with Hercules since 1918. Mr. Chase completed 40 yr of service with Hercules in June. Clarence W. Ballard has been named director of sales for the explosives department, succeeding Mr. Keane. Theodore Marvin, director of advertising for the company,

"Big Red TD 24 Puts us in the Big Time"

BIG RED CHAMP rams into a heavy load of rock and dirt overburden, pushes it along with power to spare.

Strip Miner Gets Out Five Times as Much Coal with Two Big Red Champs.

It's no cinch to strip mine where the overburden is 32 feet deep. It takes some blasting—and two International TD-24s—to gouge out 80 tons of coal a day for Charles Walls & Sons, Oliver Springs, Tennessee.

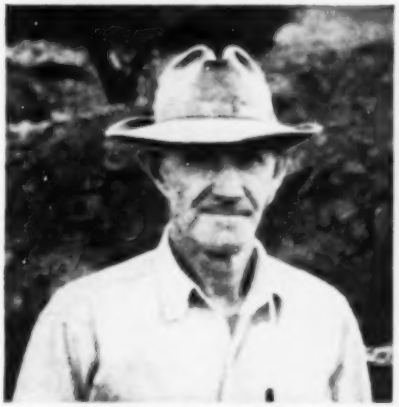
The way Mr. Walls tells it,

"We got into big time coal stripping when we put these fast powerful TD-24s to work. We soon found our production of coal about five times what it used to be, yet our labor in the mine was the same as it was before."

The Big Red Champ—International's TD-24—does jobs like this because it delivers 148 drawbar horsepower, 8 speeds forward or reverse to 7.8 mph, and has Planet Power hydraulic steering controls. All this makes the TD-24 faster, easier to maneuver, able to do more work than any other crawler on the market.

See for yourself. Ask your International Industrial Distributor to show you what Big Red can do for you. You'll be a TD-24 man from then on in.

INTERNATIONAL HARVESTER CO.
Chicago 1, Illinois



OWNER CHARLES WALLS uses TD-24s to boost his production five times with same labor.

INTERNATIONAL POWER THAT PAYS

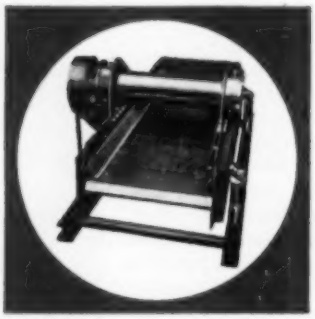
these ROUND ROD SCREENS
make you money

DOLLARS are made for you every day by the more efficient operation of Bee-Zee Screens.

DOLLARS result from more accurate screening—because screen openings remain the same throughout the Bee-Zee screen's life-span.

DOLLARS result from cleaner screens—There are no pockets where deposits can collect . . . no clogging or blinding even with high moisture materials.

DOLLARS result from longer life . . . less "down" time—Users report up to 30 times longer life for Bee-Zee screens. That's because all-welded construction of special alloy steel withstands rust, shock and abrasion . . . "round" design with built-in tension takes more punishment.



Tell us your requirements. Bee-Zee Round Rod Screens can be made with any size rod for any size opening . . . "tailor-made" to fit your equipment. Ask for free descriptive catalog.

BIXBY-ZIMMER
Engineering Co.
193 Abingdon St., Galesburg, Illinois

BEE-ZEE SCREENS CAN BE FITTED TO ANY SCREENING EQUIPMENT

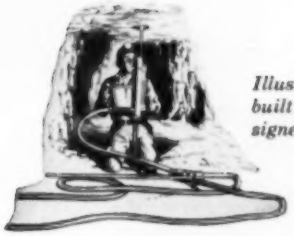
has resigned to become president of the Michigan Chemical Corp., St. Louis, Mich. Director of advertising for Hercules since 1944, Mr. Marvin has been with the explosives company for 30 yr. George A. Parker has been named manager of the explosives sales office in Pittsburgh, and Thomas E. Brown manager in Hazleton, Pa. Philip R. Hammond also was named as assistant manager in the Pittsburgh office. Mr. Parker, manager of the Hazleton office since 1948, succeeds Mr. Ballard as the Pittsburgh manager, while Mr. Brown, previously the assistant manager, succeeds Mr. Parker as the manager of Hazleton.

Euclid Road Machinery Co., Cleveland, is to be acquired by the General Motors Corp. through an exchange of stock involving 305,137 shares of GM common, it was announced last month. Terms of the merger are yet to be approved by Euclid stockholders but the company is rather closely held and no opposition is expected. Under the arrangement, Euclid stockholders will receive a half share of GM common for each share of Euclid preferred and 7.9 shares of GM common for each share of Euclid Class A stock.

Termination of the association of the Wilmot Engineering Co. and H. J. Daniels & Co., Inc., both of Hazleton, Pa., has been announced by the respective organizations. The Wilmot organization is offering the "Wilmot heavy-density system" for the preparation of anthracite and bituminous coal and other minerals, and also announces that the "Wilmot cell-froth process" for the preparation of coal finer than 50 mesh has been added to its line of Hydrotator, Hydrotator-classifier, jig and Hydro Separator equipment. Daniels announces that it is resuming production of DMS (dense-media) coal-preparation equipment in its own shops, and that its engineering department will assume direct control of all engineering and management of the Daniels DMS system. Branch offices in Indiana, Pa., and Newark, N. J., will be expanded, according to the announcement, and "sales offices in principal cities will be available for the distribution of DMS coal washers."

Industrial Engineering & Construction Co., Fairmont, W. Va., has moved its administrative offices to larger quarters at 409 4th St., and has announced the appointment of Victor Phillips as preparation engineer. He was formerly with Heyl & Patterson, Inc., Pittsburgh, as development engineer and, more recently, with Eastern Gas & Fuel Associates, Pittsburgh, as assistant preparation engineer.

Westinghouse Electric Corp., Pittsburgh, has appointed George H. McBride assistant division manager, Switchgear Div. Joining Westinghouse in 1922 at the company's Gearing Div., he was appointed industrial section head in the gearing sales department in 1927, and subsequently served in Philadelphia as Middle Atlantic Dist. gearing representative. In 1940 he returned to Pittsburgh as a headquarters representative, handling Gearing Div. marine sales, and became sales manager of the Gearing Div. in 1942.



Illustrated is Thermoflex—a mandrel-built hose with extra strength, designed specifically for use in mines.

When you are in need of hose—
Suggest you look at Thermoid!

See how extra strength is built into each length—with either tough rayon cords or special cotton fabric. Abrasive resistant—light—easily handled—resists kinking—designed for maximum service. Whether it be one of Thermoid's multiple service types or a hose designed for a specific use, your Thermoid Distributor can recommend the type best suited for your particular requirements.

Call your Thermoid Distributor. He has complete information on all types of Thermoid Hose and other Thermoid products. Our experienced Sales Engineers are available for help with unusual problems.

Thermoid
Industrial Rubber Products
Quality
Service

It will pay you to specify Thermoid.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

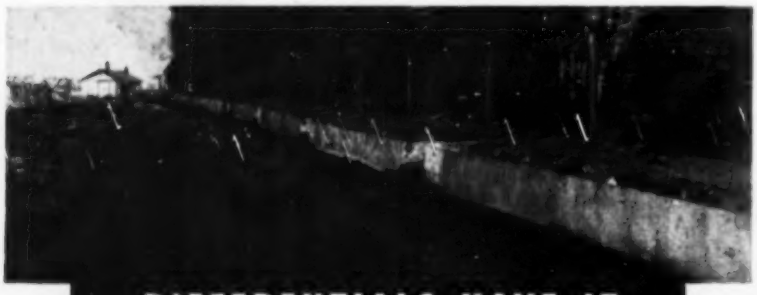
Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

CAPACITY COUNTS

These two views at the Princess Elkorn No. 1 Mine, David, Kentucky, show clearly the low height operating conditions within the mine. Differential's 24" (high) cars are really loaded — and crown-scraped — as they approach the rotary dumper (also Differential).



DIFFERENTIALS HAVE IT

The lower the entry the more clearly are Differential Mine Cars called for. The special patented "AXLESS" trucks carry payloads where other cars carry dead weight. **It's a fact** that within given length, width and height, you get **more cubic footage than in any other make!** This means fewer cars required!

It all adds up to (1) lower investment, (2) less maintenance, (3) lower operating costs. **Differentials have it** on all counts!

Send for Bulletin D-53 for details

Other Differential Products: Locomotives, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers and other dumping devices, and Complete Haulage Systems.

D
DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

SINCE 1915—PIONEERS IN HAULAGE EQUIPMENT

COAL MEN ON THE JOB . . .

POWER COAL CO., Montrose, Mo. (left photo): Oscar Shelton (left), pit foreman; Johnie Richie, tipple foreman; W. V. Hartman, superintendent; and Howard Reddick, timekeeper.

GOLDIE RAYE MINING CO., Kanawha County, West Virginia (right photo): R. H. Murrill (left), Chesapeake, W. Va., originator of the "Murrill" shuttle buggy; Art Fisher, mine foreman; and R. F. Willis, president.

Kleenslot
VIBRATOR SCREENS

They can be DESIGNED AND ADAPTED TO FIT ANY MAKE OF VIBRATOR. Perfect separation on wet or dry screening. Accurate performance on hundreds of installations.

HERE'S HOW IT'S DONE

Cross section at left shows how KLEENSLOT Screens operate on a **non-clogging principle.**

Kleenslot
SCREEN GUARDS

The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. All sizes and most materials furnished.

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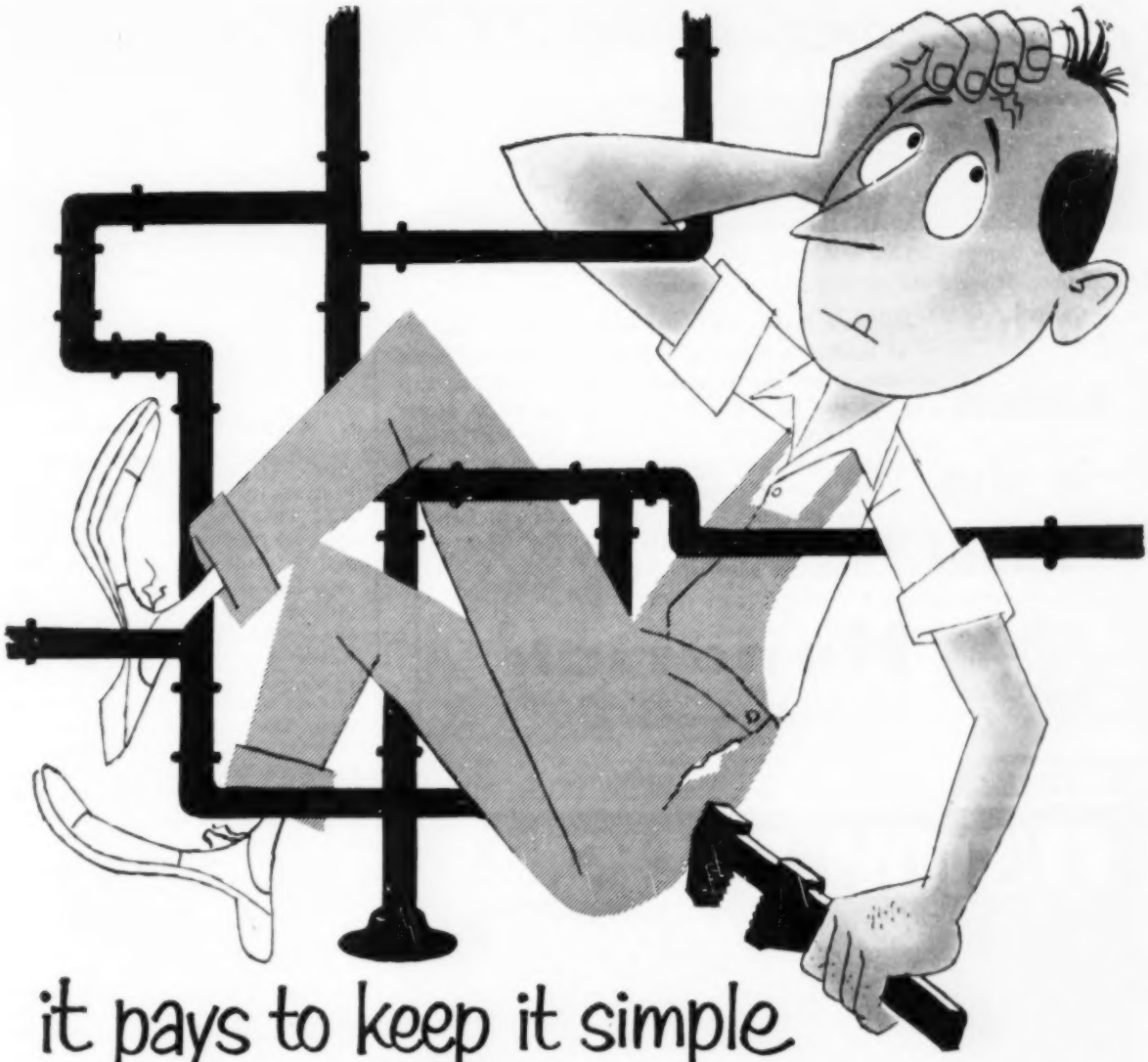

it pays to keep it simple

Why use 2 or 3 different lubricants at the face when Gulf Mining Machine Lubricant does a better job?

On most types of mining machines Gulf Mining Machine Lubricant can do the entire lubricating job at the face, which means that you can eliminate 2 or 3 other lubricants and simplify your lubricant storage and handling. You also save on application time and eliminate application errors.

For additional information on Gulf Mining Machine Lubricant, send the coupon below or call in a Gulf Sales Engineer.

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation • Gulf Refining Company CA
1934 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, a copy of your new pamphlet "Gulf Mining Machine Lubricant."

Name .....

Company .....

Title .....

Address .....

Before... and... After...

...the screen is the same!

Hendrick Perforated Metal Plate assures a long life of service on vibrating and shaking screens. Available in any desired shape or size of perforations, it can also be supplied flat or corrugated in proper gauges of regular, high carbon, and high tensile steels and in other commercially rolled metals. Full open clearance reduces blinding to an absolute minimum. Decks can be changed fast and easily, saving valuable time and labor costs. Write for more information.

Hendrick
MANUFACTURING COMPANY
41 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities
PERFORATED METAL • PERFORATED METAL SCREENS • WEDGE-SLOT SCREENS
ARCHITECTURAL GRILLES • MITCO OPEN STEEL FLOORING • SHURE-SITE TREADS • ARMORGRIDS

CUSTOM DESIGNED
.... FOR PERFORMANCE

FLOOD CITY
GENERAL PURPOSE
CENTRIFUGAL PUMPS

"FLOOD CITY" designs each and every pump for the individual job on which it is to be used. This small, sturdy pump is extremely simple to operate and maintain. Its open type, non-clogging impeller is ideal for many purposes. Made of anti-corrosive material of your choice it is still extremely economical both in first cost and in operation.

We have built acid resisting pumps from 1¼" to 6" capacity for many years and would welcome the opportunity to advise you on your pump problems.

FLOOD CITY
BRASS & ELECTRIC CO.
JOHNSTOWN, PA.
Branch Office:
4 Virginia St. W., Charleston, W. Va.

Chain Belt Acquires Shafer Bearing Corp.

PURCHASE of the Shafer Bearing Corp., Downers Grove, Ill., was announced last month by the Chain Belt Co., Milwaukee. The Shafer line of industrial roller bearings will supplement its line of sprocket chains and broaden the markets for its power transmission products, Chain Belt points out. The new acquisition, which includes a modern factory employing some 300 workers, will be operated as a Chain Belt division, with no change in management. R. P. Tennes, former Shafer president, will be division manager.

Le Roi Co., Milwaukee, Wis., has announced the formation of a new division manufacturing front-end loaders and truck-mounted mixers. N. M. Sedgwick, formerly general sales manager for the Construction and Mining Div., was named general manager of the new division, known as the Le Roi-Transo Div. W. D. Lund, formerly assistant to the general sales manager, Construction and Mining Div., is assistant general manager of Le Roi-Transo. R. H. Rodolf, manager, rock drill sales, Cleveland Rock Drill Div., succeeds Mr. Sedgwick as general sales manager, Construction and Mining Div. C. L. Meigs has been named manager, portable compressor sales, and A. J. Jensen has been named assistant to the general sales manager, Construction and Mining Div.

Colorado Fuel & Iron Corp. has named E. J. Byrnes Jr. assistant general manager of sales, Eastern Div., with new headquarters in New York City. In 1925, prior to the merger with CF&I, Mr. Byrnes joined the then Wickwire Spencer Steel Co. as an administrative assistant. In 1938, he was made assistant product manager of the Springs and Formed Wire Dept. and in 1940, was promoted to the post of product sales manager of the department.

King Powder Co., Inc., Cincinnati, Ohio, has announced the retirement of Frank P. Morse, sales manager of the company for 34 yr. D. H. Weber, who

ANNOUNCING
THE DU PONT VOLTOHMETER

. . . a triple-purpose precision instrument for testing electric blasting operations

The Du Pont Voltohmeter is an entirely new, all-purpose precision instrument designed for testing in connection with electric blasting. It combines the functions of Du Pont Blasting Galvanometers, and Detect-A-Meters, and offers many other advantages.

1. **As a blasting galvanometer,** the Voltohmeter may be used to measure resistance of electric blasting caps, blasting circuits and firing circuits accurately. One dial setting has a range of 0 to 100 ohms, and another, from 0 to 1000. The scale is graduated for easier, more accurate reading, and a convenient zero-mark adjustment is provided.

2. **As a stray-current detector,** the Voltohmeter offers greater flexibility in detecting, tracing and identifying both AC and DC voltages. Separate scales are provided reading from 0-1.5 volts DC, 0-1.5 volts AC, 0-30 volts DC and AC and 0-600 volts DC and AC.

3. **As a voltmeter,** the new Voltohmeter may be used for testing all power-line voltages commonly used in electric blasting operations, up to 600 volts . . . both AC and DC.

Each Voltohmeter is in a sturdy leather carrying case with shoulder strap and pocket containing two plastic insulated probe wires with insulated alligator clips shown below. An instruction plate and pamphlet are also included. Compact, it measures only 6⅝ x 3¾ x 4½ inches; weighs only 2½ pounds.

Ask the Du Pont Explosives representative in your district for complete information about this new, highly efficient, triple-purpose instrument for promoting safer blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

THE W. R. STAMLER COMPANY

Manufacturers of the most modern

HYDRAULIC BARNEY CAR SPOTTER

announces that

SCHROEDER BROS. of PITTSBURGH, PA.

are the exclusive

SALES and SERVICE REPRESENTATIVES

for the

STAMLER HYDRAULIC CAR SPOTTER

in the Eastern Bituminous Coal Fields.

THE W. R. STAMLER COMPANY

PARIS • BOURBON CO. • KENTUCKY

Built for LOW Clearance...

Type F Built as low as 28".

and for TOUGH SERVICE

Atlas Type F Storage Battery Locomotives are built with 2 motors like trolley locomotives. One motor drives each axle through Atlas' dependable spur gear drive. Built low to go anywhere your mine cars can travel.

CUSTOM BUILDER OF COAL MINING LOCOMOTIVES

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

was sales representative in the northern Ohio field for 15 yr, before becoming assistant sales manager, succeeds Mr. Morse. During 1953, King Powder celebrates its 75th anniversary.

United States Rubber Co. has formally opened its new Denver branch at 4800 Colorado Blvd., built to serve the rapidly expanding markets in the Rocky Mountain area. The building supplies 84,000 sq ft of floor space, including 10,000 ft of air-conditioned offices, has ample parking facilities for employees and customers, and is fully equipped for mechanical handling of merchandise. James C. Westfall has been named assistant to Ernest G. Brown, vice president and general manager, mechanical goods division. Joining U. S. Rubber in 1929, Mr. Westfall was formerly assistant superintendent, belting department, in the company's Passaic plant.

Nordberg Mfg. Co., Milwaukee, Wis., has named J. D. Grace sales manager, screen department of the Crusher Div. Mr. Grace has been manager of the advertising and sales development department for the past 3 yr and prior to joining Nordberg in 1947, he was with Bucyrus-Erie Co. R. E. Schulz, advertising assistant, has been appointed manager of advertising and sales development.

Caterpillar Tractor Co., Peoria, Ill., has announced creation of an Engine Div. as a new major component of the company. To be managed by H. H. Howard, formerly director of domestic sales, the new organization is an outgrowth of a need to meet customer requirements for sales and engineering of industrial engines built to special arrangements. Also announced was establishment of a sales-promotion department with W. K. Cox, now advertising manager, as manager of the new department, which will include the sales-training and sales-development divisions and the advertising department. Named to succeed Mr. Howard was W. S. Zeigler, now assistant director of domestic sales, who will manage the domestic sales department. Caterpillar also reports that it has selected Decatur, Ill., as the site of a new plant which will manufacture motor graders and industrial wheel tractors. Total cost of new machinery and equipment at all plants, and of land and buildings at the new plant, in the latest realignment of the company's manufacturing facilities, is estimated at $45,000,000. Warren Kinsey, has been named manager of the new plant; A. W. Johnson, manager of manufacturing; Ridley Orton, purchasing agent; H. O. Nelson, manager of employee relations and C. A. Vobroucek, chief accountant.

Republic Steel Corp., Cleveland, has appointed H. M. McDaniel to the sales staff of its pipe division, and Jay W. Owings, pipe-division sales manager. Mr. McDaniel will supervise the sale of plastic pipe and tubing, a field entered by Republic in June. Mr. Owings has spent 25 yr in the pipe industry, chiefly with Youngstown Sheet & Tube Co., where he was assistant general manager of sales.

The strongest rack bar makes the toughest jack

A ratchet jack like the Duff-Norton all-purpose 516 MT is no stronger than its rack bar, the notched steel "heart" that moves up and down holding the load. The forged steel rack bar on this 5-ton capacity coal mining jack is stronger and tougher than the rack bar on any other ratchet jack of this type. It's *stronger* because it's *larger!*

Next time you see a Duff-Norton jack, examine the rack bar; you'll notice it's oblong like this ▬. Then look at the rack bar on any other make ratchet jack. It's smaller, like this ■.

So get the most and best for your money with a Duff-Norton Jack.

Ask your distributor for information about Duff-Norton Jacks for coal mines. There's a jack for every lifting, pulling, and pushing job . . . or write the world's oldest and largest manufacturer of lifting jacks for your copy of "A Handy Guide for Selecting Duff-Norton Mine Jacks." Ask for bulletin Ad 10-J, The Duff-Norton Manufacturing Co., P.O. Box 1889, Pittsburgh 30, Pa.

Long a favorite with coal miners is the 516 MT. It can raise 5 tons up to 9½ inches, is only 16 inches high when closed, has the famous oblong rack bar for greater strength and dependability.

DUFF-NORTON Jacks

"Giving Industry A Lift Since 1883"

UPSON-WALTON

wire rope craftsman

CLOSE tolerances in wire rope diameter depend on the accuracy of the forming dies. These dies are carefully polished, and their surfaces checked at frequent intervals—another example of Upson-Walton craftsmanship which builds high quality for long service into Upson-Walton wire rope.

Upson-Walton wire rope is sold through selected distributors. Free catalog available on request.

THE UPSON-WALTON COMPANY

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MANUFACTURERS OF TACKLE BLOCKS, WIRE ROPE, ROPE FITTINGS—ESTABLISHED 1871

COAL MEN ON THE JOB . . .

KEELEY CONSTRUCTION CO., Harrison County, W. Va.—President J. P. Keeley Jr. (left) discusses mining plans with S. D. Griffith, vice president and assistant treasurer.

International Harvester Co., Chicago, has established an Industrial Power Div. sales department to handle the growth and expansion of Harvester's industrial power line of products. I. P. Payne has been named manager of the new sales department. Associated with the sale of IH industrial power products since 1937, he has been assistant manager, general sales, since 1949. W. M. Holland and C. E. Jones have been appointed assistant managers of sales for the division.

The Okonite Co., Passaic, N. J., has appointed Thomas J. Manning, district manager of the Cincinnati office. Mr. Manning has been associated with Okonite as a sales engineer in the Birmingham, Ala., district office since 1946.

Jet-Lube, Inc., Los Angeles, has appointed Hugh R. Van Wagenen, consultant to its mining division. Mr. Van Wagenen has worked in many foreign countries as well as the mining areas of the United States. A graduate of the Colorado School of Mines, he will continue his practice as consulting mining engineer.

Koppers Co., Inc., Pittsburgh, Pa., has promoted B. Otto Wheeley to southern district sales manager for the Tar Products Div. Mr. Wheeley, formerly assistant district manager, with headquarters in Birmingham, Ala., succeeds F. G. Owen, who died June 21.

New York Belting & Packing Co., Passaic, N. J., has made the following changes in its sales division. Named to regional sales manager posts were Wenzel A. Lindfors and Carl G. Link. Mr. Link will handle the Great Lakes region including Chicago, Pittsburgh and Detroit. Mr. Lindfors will supervise sales in the rest of the country. Wilbur E. Combs has been appointed merchandise manager and Harry H. Raber sales operating manager.

General American Transportation Corp.

Get these savings in your clutches

SUPERLA
REG. U. S. PAT. OFF.
Mine Lubricants

● Clutch repairs costs down 50% . . . no delays for "warming up" loaders . . . easier and faster loading . . . these benefits have been brought to midwest mines by SUPERLA Mine Lubricants. Here's why these products will assure similar benefits for you.

SUPERLA Mine Lubricants keep transmission cases clean. Clutches operate easily with no gumming or coking caused by oil deposits. When machines are started, these lubricants flow readily between clutch plates, protect them against wear, eliminate "clutch drag" and the necessity for warming up loaders. During long periods of continuous operation, SUPERLA Mine Lubricants do not thin out excessively, provide safer lubrication for clutch plates.

A test of SUPERLA Mine Lubricants will prove their ability to keep your loaders on the job longer with less maintenance. These products are available in oil and grease grades suitable for any type of cutter or loader. A Standard Oil lubrication specialist will gladly help you select the proper grades for your equipment. You can reach him by phoning your local Standard Oil Co. (Ind.) office. Or, write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY

STANDARD OIL COMPANY
STANDARD
(Indiana)

THE EASIEST WAY TO MAKE ENDS MEET

VICTAULIC FULL-FLOW TEES ELBOWS AND ALL TYPES OF FITTINGS ALL WIDELY ADAPTABLE AND EASY-TO-INSTALL ARE ONLY PART OF THE COMPLETE MODERN VICTAULIC 4-STAR METHOD OF PIPING. YOU ARE ASSURED FAST, STREAMLINED EFFICIENT CONSTRUCTION THAT SAVES $$$$ WITH VICTAULIC COUPLINGS FOR LOCK-TIGHT, LEAK-PROOF CONNECTIONS AT EVERY JOINT UNDER PRESSURE OR VACUUM; PLUS CONVENIENT PORTABLE VIC-GROOVER TOOLS FOR GROOVING STANDARD PIPE ENDS WITH SPEED AND EASE; AND QUICK, HANDY ROUST-A-BOUT COUPLINGS FOR PLAIN END PIPE AND ALL-'ROUND VERSATILITY. MAKE SURE YOUR NEXT JOB IS ALL VICTAULIC! PROMPT AVAILABILITY FROM LOCAL DISTRIBUTOR STOCKS COAST-TO-COAST.

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has named Richard H. Lamberton Midwest manager, Plate and Welding Div., with headquarters in Chicago. Mr. Lamberton is also serving as assistant director of the Office of Defense Transportation, Railroad Div., and as a special agent of the ICC.

Marion Power Shovel Co., Marion, Ohio, has appointed Kern-Limerick, Inc., its distributor in Arkansas. In business since 1927, Kern-Limerick is one of the oldest distributors in the state, handling a wide variety of road building and maintenance machinery, contractors equipment and supplies. R. C. Limerick is president and Roy L. McDonald Jr., is sales manager. Offices are at 115 N. Spring St., Little Rock.

Toledo Porcelain Enamel Products Co., Toledo, Ohio, a subsidiary of the Bettinger Corp., Waltham, Mass., has appointed regional sales representatives for V-Corr improved enameled steel roofing and siding material, as follows: Cleveland, Ohio, Hyslop & Fisher, 1935 Euclid Ave.; St. Louis, Mo., L. C. Murphy & Co., 747 Paul Brown Bldg.; Kansas City, Mo., Van Scoy Sales Co., 605 E. Meyer Blvd.; Fairmont, W. Va., Henry E. Schweinsberg, 609 View Ave.; Montgomery, W. Va., D-Q Co.; Greensboro, N. C., Atlanta, Ga., Richmond, Va., Beaman Engineering Co., P. O. Box 504, Greensboro, N. C.; Chicago, Ill., Riggs Industrial Supply Co., 127 St. & Central Park Ave., Blue Island, Ill.

A. P. Emmert, former president of Warner Gear Div., Borg-Warner Corp., has been appointed general manager of the Detroit Gear Div. Mr. Emmert succeeds A. J. McAllister, who has retired from the presidency of Detroit Gear to devote his full attention to personal business interests.

LeTourneau-Westinghouse Co., Peoria, Ill., has reorganized its domestic sales territories into Eastern and Western Divs. instead of Eastern, Central and Western as heretofore. J. A. Vincent continues as Eastern Div. sales manager, and F. W. Duke, former district sales representative for the company, has been appointed Western Div. sales manager.

Boston Woven Hose & Rubber Co., Boston, Mass., has named Thomas Hayes light mechanical development manager, in charge of research and development of such products as friction tape, matting, treads and packing. Mr. Hayes was formerly associated with Canadian Industries, Ltd., a du Pont subsidiary, and the Westinghouse Electric Corp.

The John Hewson Co., New York, has appointed H. E. Ransford Co., Grant Bldg., Pittsburgh 22, its representative for sales, field application and servicing of its line of insulation test sets, power supplies and static control systems.

Reliance Electric & Engineering Co., Cleveland, Ohio, has appointed Donald L. Peterson, as engineer, in its Cleveland district sales office.

Carbon Malleable Casting Co., Inc., Lancaster, Pa., as part of its building and expansion program, has changed its name

U.S. ROYAL

CON-TRAK-TOR

FULL LUG

Pulls Down Haulage Costs!

Assign your rugged haul-loads *here!* This new Con-Trak-Tor is built with exclusive full-width lugs for *super* truck *traction*. It's got *triple protection* against impact—extra rubber between plies, double shock-pads, rock-resister cap-plies. It pulls and *works*, saves and *pays* like no other off-road tire! **Also available in Nylon for heaviest duty.**

Want proof? See or phone your U. S. Royal Dealer *Today!*

Specialized by U. S. ROYAL to do your jobs better!

U. S. ROYAL FLEETMASTER	U. S. ROYAL ROAD TRACTION	U. S. ROYAL LUG TRACTION
Smooth rolling *on* the road, superior traction *off*. 70% more tread depth!	New steering ease where most hauling is on-road at reasonable speed.	Best for high traction at low speeds off the road or on unimproved roads.

FREE—NEW 64-PAGE BOOKLET *SEND COUPON!*

U. S. Royal Truck Tire Department,
United States Rubber Company, Dept. C,
1230 Avenue of the Americas, New York, N. Y.

Please send me your new booklet of latest tire information, engineering and service aids, weight charts, load and inflation tables, etc.

Name _____

Company _____

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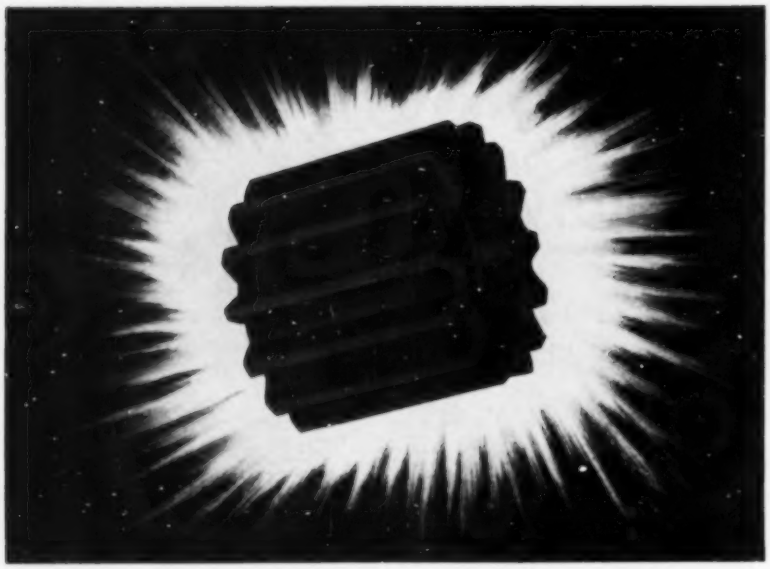
City & State _____

U. S. ROYAL TIRES *Product of* **UNITED STATES RUBBER COMPANY**



This Pittsburgh Purple

ARMORED Gear

might save you a good many dollars

Increasing gear life may be a real problem for you but it's our business. It is something we do by combining design, metal, and machining with a special heat-treating process and experience we have gained making quality gears since 1914.

The PITTSBURGH Armoring process puts the right hardness in the right places. It makes the wearing surfaces hard but leaves the core tough and shock-resistant. **Armored Gears** are so good that we guarantee them to give you longer service.

Your PITTSBURGH GEAR distributor will give you more information and names of operators near you who have used **Armored Gears** for years. He stocks standard renewal gears and parts that will save you money. Write us for his name.

Look for the "**Pittsburgh Purple**" protective coating on the gears you buy.

GEARS
and
PARTS
for
LOADERS
CUTTERS
LOCOMOTIVES
ETC.

Your Guarantee of Longer Life

PITTSBURGH GEAR COMPANY
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Pittsburgh 22, Pa.
Phone: ATlantic 1-9950

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

COAL MEN ON THE JOB . . .

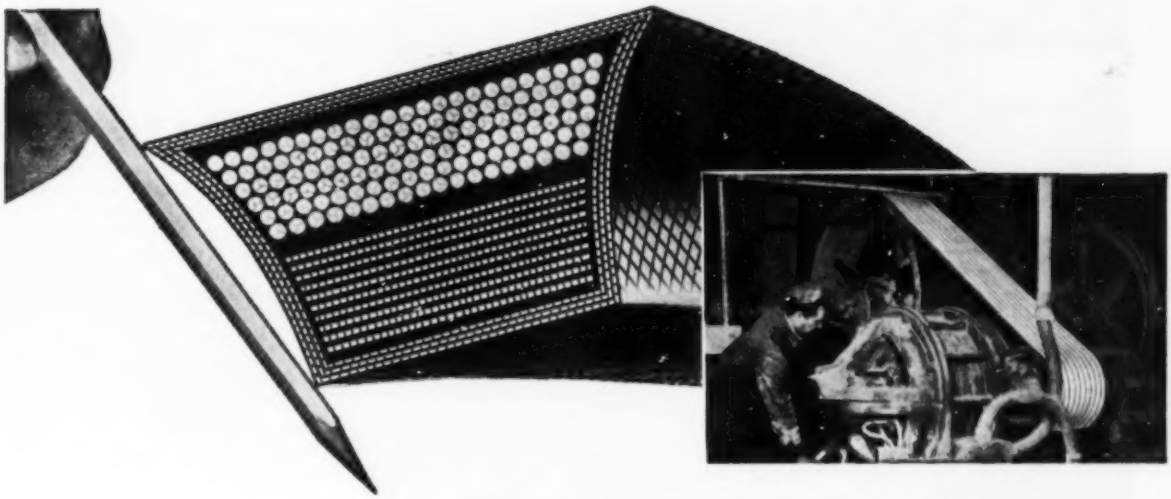
KEELEY CONSTRUCTION CO., Keeley No. 3 mine, Harrison County, W. Va. —J. P. Dolan (left), superintendent; O. E. Johnson, pit foreman; and R. K. Dilgard, crusher foreman.

to Pennsylvania Malleable Iron Corp., according to Charles P. Speitel, president. Since 1948, the company has spent some $250,000 on new equipment for production of made-to-order castings, erected new buildings and increased its working force under an enlargement program still continuing.

General Electric Co., Schenectady, N. Y., has made plans to build a $5 million plant at Bloomington, Ill., to manufacture general-purpose controls for industrial use. Construction of the new facilities will start this year on a 66-acre tract, and more than $2 million worth of equipment will be installed.

Chain Belt Co., Milwaukee, in another step in its long-range program of providing better and faster service for both customers and distributors, recently opened a new Philadelphia warehouse to better serve the New England and Middle-Atlantic states. The new warehouse occupies a new 15,000-sq ft building at 4125 Whitaker Ave., Philadelphia 24, and will provide immediate availability and prompt shipments of Rex and Baldwin Rex products, as well as also housing the company's Philadelphia district sales office. William Sivyer, district sales manager, will head the warehouse activities. Located at the same address will be a newly created Rex Construction Machinery district office under Richard M. Leek.

Builders Iron Foundry, Providence, R. I., is changing its name to B-I-F Industries, Inc., as more appropriate in perpetuating the past history of one of New England's oldest corporations, while at the same time giving a better picture of its actual operations and products manufactured. The step also is designed to eliminate any confusion arising from the word "Foundry" in the name, which was adopted in 1853. Builders Iron Foundry will be continued but will be restricted to foundry sales, which now represents less than 10% of the company's business.



Gates V-Belts are built with CONCAVE SIDES

(U.S. PATENT NO. 1813698)

...that's why they last longer!

If you want lower V-Belt costs, just make this simple test...pick up *any* V-Belt and bend it as if it were going around a pulley.

As the belt bends, grip its sides between your fingers and thumb.

If the belt has *straight sides* you feel the sides bulge out. This forces the sides of the belt to press *unevenly* against the V-pulley . . . and you get concentrated wear at the points shown by the arrows.

Now, try this same test with the V-Belt that is built with CONCAVE SIDES **—the Gates Vulco Rope.**

As this belt bends, you can feel the CONCAVE SIDES *fill out* and become perfectly straight.

These sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the full width of the Gates Vulco Rope and the CONCAVE SIDES therefore mean longer belt life and lower V-Belt costs for you.

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

CS-935

V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker of V-Belts

Gates® VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

Engineer answers vital questions about the strongest wire rope made—Flattened Strand

What is Hercules® flattened strand wire rope? Why does it outperform round strand rope by 2 to 1 or more? Can you use it? Walter C. Richards, chief engineer, Leschen Wire Rope Division, tells you the answers.

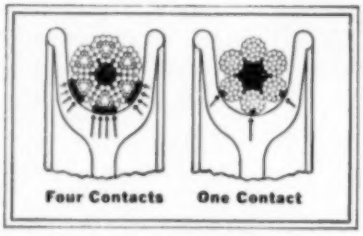
More and more wire rope users are continually experiencing or hearing about spectacular performances of Hercules Flattened Strand wire rope. The explanation is clear.

First, Hercules Flattened Strand is a Super-rope because it packs 10% more steel than any round strand rope of the same size. It's 10% stronger... 10% safer.

Second, Hercules Flattened Strand wears longer and more evenly. That's because there are four wires per strand contacting sheave grooves instead of one.

Third, Hercules Flattened Strand resists crushing and internal strand-cutting, because strands rest snugly against each other, keystone fashion, with less internal pressure or friction.

Fourth, Hercules Flattened Strand prolongs its own life and the life of equipment, because the relatively smooth surface of the rope prevents corrugating and wear on sheave grooves.



With Flattened-Strand, notice how four wires per strand contact sheave grooves —reducing rope and equipment wear.

Can you use it?

It's a known, proved fact that no other wire rope made can equal Flattened Strand on applications such as hot ladle cranes, skip hoists, and dredge ropes. It is also best on a variety of other equipment both large and small. For many uses, it is truly a Super-rope.

But, the question is, can *you* use it to advantage? That can be answered only by a qualified wire rope engineer who is thoroughly acquainted with the characteristics and proper uses of Flattened Strand rope.

Check with the authority

That means, check with Leschen. It's wise to do so because Leschen pioneered and perfected Flattened Strand wire rope. Leschen developed special machines to make it. Leschen conducts continuing research on correct uses. Leschen is the authority.

If you discover you can use this Super-rope—Hercules Flattened Strand—you'll soon begin saving time, labor and money. Why not investigate *now?*

LESCHEN WIRE ROPE DIVISION · ST. LOUIS 12, MISSOURI
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)

American Ventilating Hose Co., Div. of Callahan Zinc-Lead Co., Inc., has changed its name to The Flexaust Co., to better identify itself with its products.

Aeroquip Corp., Jackson, Mich., has added to its operating and storage facilities with the purchase of the Sterling Electric Motors plant in Van Wert, Ohio. Don T. McKone Jr., formerly assistant general manager of Aero-Coupling Corp., a West Coast subsidiary, will head the Van Wert plant as general manager. The new plant contains 45,000 sq ft on an 11-acre site. Concurrent with the Van Wert acquisition, Aeroquip has announced the addition of approximately 5,500 sq ft of floor space to the Aero-Coupling plant in Burbank, Calif.

The Ludlow-Saylor Wire Co., St. Louis, has changed its name to Ludlow-Saylor Wire Cloth Co. No changes are planned in the operation of the business, except to expand and improve production facilities, and the officers and directors remain the same. Established in 1856, the company had operated under its former name since 1875.

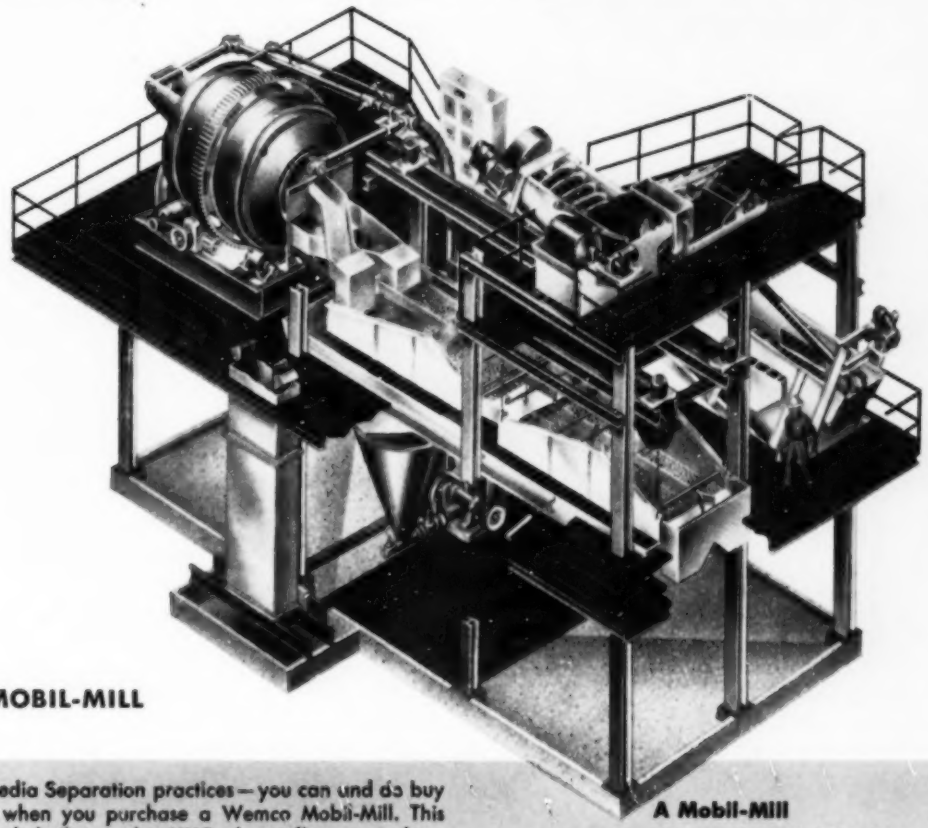
United States Steel Corp., Pittsburgh, held groundbreaking ceremonies for its new research and development laboratory at Monroeville, Pa., July 29, with company officials and 200 Monroeville citizens in attendance. The new research center will consist of three buildings with a total floor area of 132,000 sq ft. Experimental equipment will include apparatus for studying every phase of the making, shaping and processing of iron and steel from raw materials to finished products.

Electro-Nite Carbon Co. is constructing a new plant at Torresdale Ave. and Strahle St., Northeast Philadelphia. Located in Philadelphia since 1920, and at its present location since 1936, the company will more than double its production area and substantially increase its laboratory and testing facilities through this expansion program.

Brown & Root, Inc., Houston, Texas, has announced the creation of a Mining and Metallurgical Div. with offices at One Wall St., New York City, headed by D. Moreno and E. H. Monroe, mining engineers, offering engineering, process designing, consulting and construction services to the mining industry.

The Baker-Raulang Co., Cleveland, celebrates its 100th anniversary this year. From its early beginnings as a wagon-repair and blacksmith shop opened in 1853 by Jacob Rauch, a German immigrant, the firm has become a leading manufacturer of fork lift trucks and cranes. After 25 yr in business, Mr. Rauch took in Charles Lang as a partner and formed the Rauch & Lang Carriage Co. The firm had become an important electric auto manufacturer by 1915, when it and the Baker Motor Vehicle Co. merged to form Baker-Raulang. Walter C. Baker founder of that company, working with Thomas A. Edison, developed in 1898 one of America's first electric autos. In 1902, his "Torpedo" electric car set new records with a speed of 104

have you ever wanted to buy "experience"?



WEMCO MOBIL-MILL

In Heavy-Media Separation practices—you can and do buy experience when you purchase a Wemco Mobil-Mill. This prefabricated, built-to-order HMS plant offers a modern, highly economical method for precision coal cleaning. Behind every Mobil-Mill unit lies Wemco's extensive experience and leadership in HMS equipment manufacture. Attesting to this leadership is the fact that of all HMS plants in the world today, **more than 50% are Wemco Mobil Mills.**

WEMCO EXPERIENCE RESULTS IN THESE MOBIL-MILL ADVANTAGES

EFFICIENT CLEANING—accurate, consistent separations with high yield over a wide range of sizes and grades.

PREFABRICATED—for quick, low-cost field assembly in minimum time by Wemco or your own crews; easily dismantled and relocated.

FLEXIBLE DESIGN—engineered with a choice of components in combinations to suit individual coal washing characteristics.

MINIMUM FIRST COST—comparatively small capital investment per ton of washed coal.

LOW OPERATING COSTS—total costs average as low as 8c to 12c per ton of washer feed.

A Mobil-Mill Size and Model for Every Need

- Plants designed to handle any tonnage.
- Built to order for your job.
- Choice of 3 types of separators:

SINGLE DRUM—for accurately controlled washing of a full range of sizes from 8" to ¼".

TWO-COMPARTMENT DRUM—for efficient cleaning of coal with middling content requiring two-gravity, three-product separation.

CONE—for economical production of coal up to 4" in size.

Write for Bulletin M-3-M-4 containing further information on Mobil-Mill applications to coal cleaning problems.

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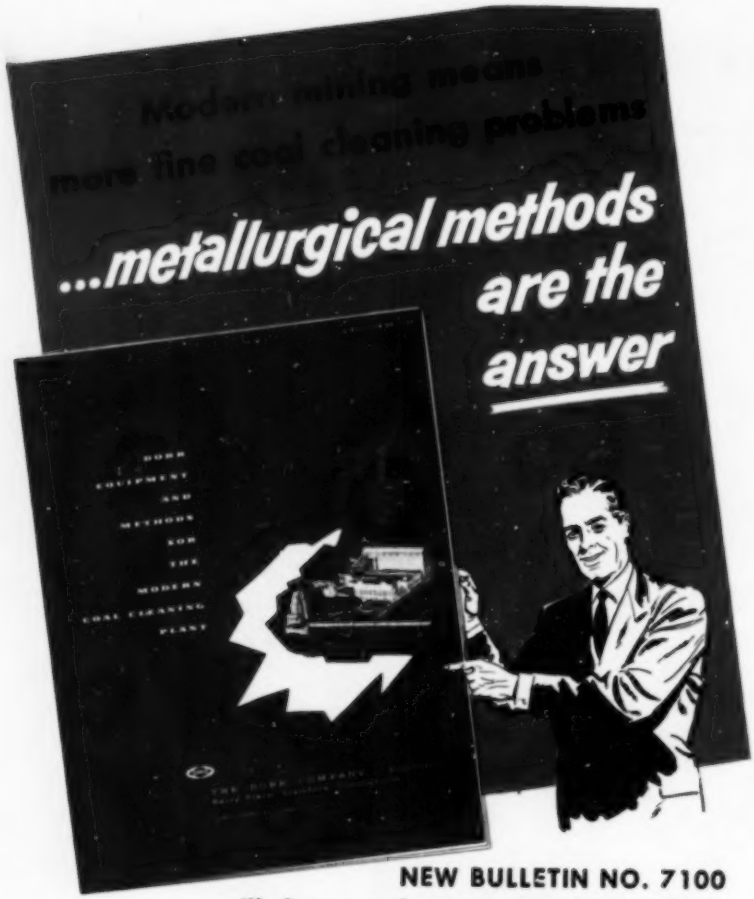
Modern mining means more fine coal cleaning problems
...metallurgical methods are the answer
DORR EQUIPMENT AND METHODS FOR THE MODERN COAL CLEANING PLANT

NEW BULLETIN NO. 7100
will show you how metallurgical methods can help you solve the problems of . . .

- ✓ *dewatering* table feed, concentrates and tailings
- ✓ *slimes thickening* and water clarification
- ✓ *desliming* for fine coal recovery
- ✓ *pumping* and metering underflow from Thickeners and Hydroseparators

Today's mechanized mining and loading techniques have resulted in greater production and economy for the coal producer. But they've brought him problems too . . . in the form of vastly increased quantities of non-coal products in washing plant feed. Tough too, for the washing plant operator is today's emphasis on better coking coal quality and the increasing stringency of stream pollution regulations.

If these problems sound familiar to you, it will pay you to write for Bulletin #7100, "Dorr Equipment and Methods for the Modern Coal Cleaning Plant." It will tell you how *proven* metallurgical methods can be applied. The Dorr Company, Engineers, Stamford, Conn.

Better tools TODAY to meet tomorrow demand

DORR

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mph. Just prior to World War I, the newly formed company began producing industrial trucks and tractors for military use at the request of the government, and never returned to manufacturing automobiles. Since that time it has concentrated on powered handling equipment for industry. Latest in a long list of "firsts," the company points out, is the recently announced Baker Gas-O-Matic providing a radically new type of power and unusual economies for fork-truck users.

NEWS BRIEFS . . .

From p 136

ployees, and also that each leased mine had its own entry and that there was no joint occupancy of premises or joint use of equipment. The lessees thus were bona fide independent contractors, the court decided. In another case of the NLRB v Lehigh Portland Cement Co., the same court held that company houses are within the realm of required collective bargaining if their ownership and management materially affect conditions of employment. The court ruled that the employer was guilty of refusal to bargain because rents were raised without consultation with the union.

Indiana Utility to Build Coal-Fired Power Plant

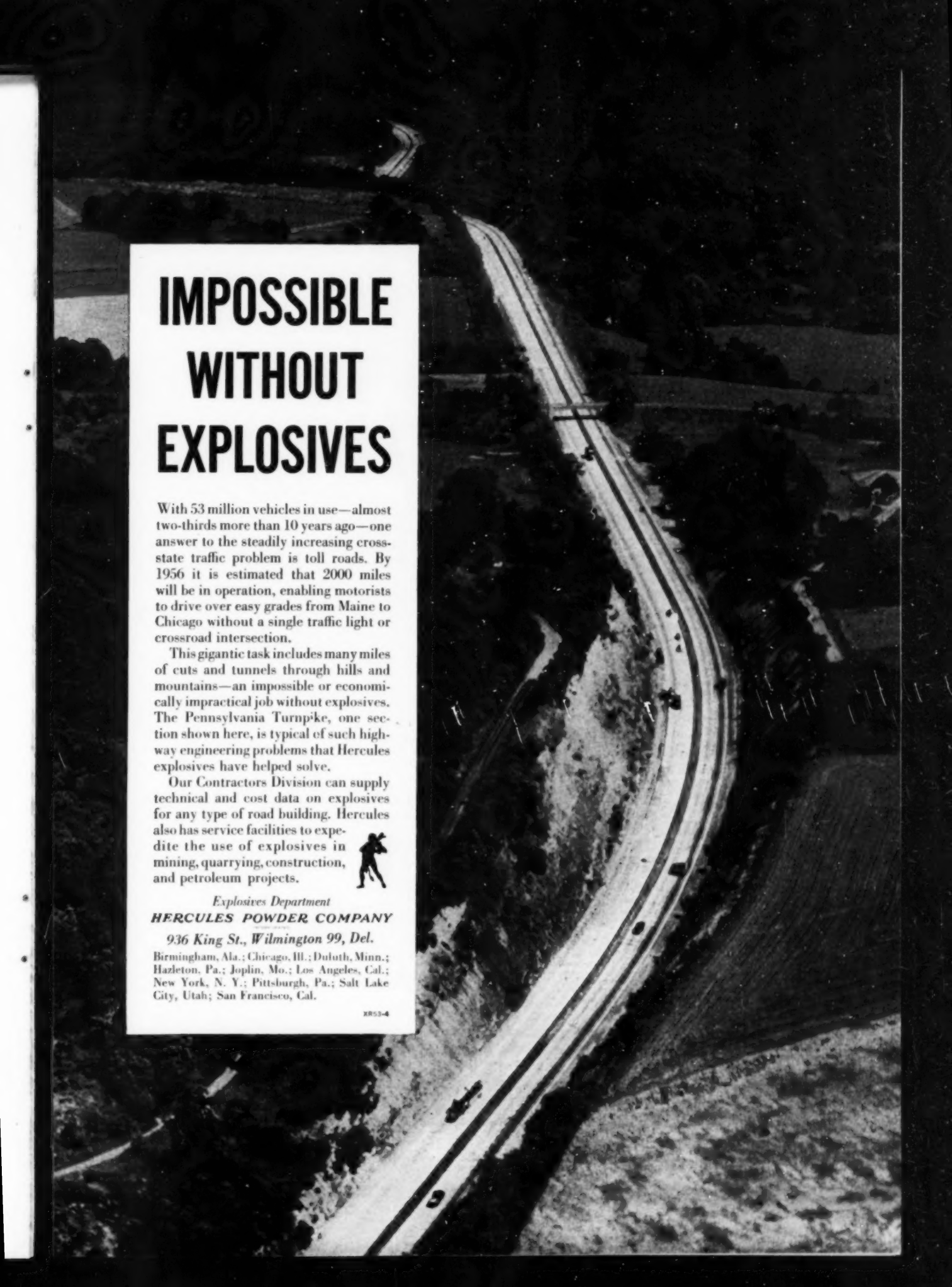
Purchase of 200 acres of land on the Ohio River near New Albany, Ind., for the erection of a new power plant with an eventual capacity of 600,000 kw was recently announced by R. A. Gallagher, president of the Public Service Co. of Indiana, Plainfield, Ind. Although the plant is being located on the Ohio to utilize river transportation and most of the coal requirements are expected to be supplied by barge, some Indiana rail-shipped coal also is expected to be used since the plant site is adjacent to tracks of the Southern Ry.

Michigan Industry Needs Coal Power, Study Shows

Expansion of electric power capacity in upper Michigan is a prerequisite for any industrial development of the area according to a report recently completed by Ebasco Services, Inc., for the Michigan Economic Development Commission. In its report, the engineering survey firm concluded that the "most feasible solution to the power problem lay in construction of a large steam-generating plant, centrally located, from which the numerous utilities could draw for additional electric power." It also urged concerted efforts to obtain imported natural gas from Canada for other industrial and domestic users.

Ky. Organizer Shot; Picket Convicted in Widen Slaying

Charles Vermillion, a UMWA organizer in the Clay-Leslie counties coal fields, was found shot to death in his parked car near Hyden, Ky., Aug. 6. Mr. Vermillion was one of four union members wounded from ambush last



IMPOSSIBLE WITHOUT EXPLOSIVES

With 53 million vehicles in use—almost two-thirds more than 10 years ago—one answer to the steadily increasing cross-state traffic problem is toll roads. By 1956 it is estimated that 2000 miles will be in operation, enabling motorists to drive over easy grades from Maine to Chicago without a single traffic light or crossroad intersection.

This gigantic task includes many miles of cuts and tunnels through hills and mountains—an impossible or economically impractical job without explosives. The Pennsylvania Turnpike, one section shown here, is typical of such highway engineering problems that Hercules explosives have helped solve.

Our Contractors Division can supply technical and cost data on explosives for any type of road building. Hercules also has service facilities to expedite the use of explosives in mining, quarrying, construction, and petroleum projects.

Explosives Department

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XR53-4

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• You can't beat *safe* American Couplers for today's big cars and longer trains. Heads are husky, one-piece steel castings which *enclose and protect* locking parts. Buffing exerts no side pressure. It is taken by sturdy flanges, without impact on the lock. Pull is transmitted through steel-to-steel contacts—*not* through the lock pivot pins.

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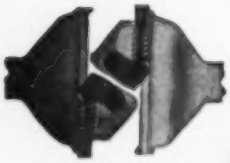
You get extra-wide gathering range—5" axial displacement or 60° angularity, *horizontally;* 2⅞" displacement or 18° angularity, *vertically.* Locks grip tightly—prevent slack and costly wear. You can rotary-dump *without* uncoupling; unlock from either side. Get the utmost in safety and savings now! *Standardize on* American Automatic Mine Car Couplers.

ALWAYS READY TO COUPLE



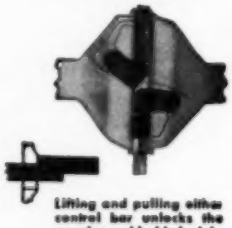
Any two heads couple—and they're always ready to couple, because locks pivot freely in uncoupled heads. Movement of lock-control bar remains unrestricted until flanges of two heads come together.

HOW AMERICAN COUPLERS LOCK

WON'T "CREEP"

As pivoted locks swing into engagement, each control bar drops to lock against the flange of opposite head.

LOCK-SET FOR UNCOUPLING



Lifting and pulling either control bar unlocks the coupler and holds lock in lock-set position until heads move apart.

Safe...Sure AMERICAN MINE CAR COUPLERS

AMERICAN STEEL FOUNDRIES, 410 N. MICHIGAN AVE., CHICAGO 11, ILL.

January. His death is the latest development in the long UMWA campaign to unionize the area. The first of three pickets to stand trial for the killing of an employee of the Widen (W. Va.) mine of the Elk River Coal & Lumber Co. was convicted Aug. 7 of second-degree murder after a 11-day jury trial in the Clay County circuit court. Jennings Roscoe Bail was convicted of the killing of Charles Frame, who was one of the employees continuing to work during the Widen strike last fall.

New Scholarship Awarded in Western Kentucky Field

Granting of the Henry A. Petter Scholarship for the coming school year to William Laffoon, Madisonville, Ky., was announced last month by the Western Kentucky Mining Institute. Established in April, 1953, by Stanley D. Petter, Paducah, Ky., the scholarship provides $250 annually to a resident of the Western Kentucky coal fields for the matriculation or continuance of a course of study for an engineering degree at the University of Kentucky. It is to be administered by the Western Kentucky Mining Institute and members of that organization's scholarship committee are: Wm. L. Husk, West Kentucky Coal Co., chairman; Herman Knight, Bell & Zoller Coal & Mining Co.; and E. C. Parks, Miners Coal Co.

New AGE Power Plant to Use 1,080,000 Tons of Coal Yearly

The American Gas & Electric Co. gave the press a preview Aug. 18 of its newest steam-electric generating plant. On display was the first turbo-generating unit at the Kanawha River plant at Glasgow, which recently began supplying 200,000 kw of electric capacity to the seven-state AGE system and is said by the company to be the largest re-heat-type generating unit in the nation. A second 200,000-kw unit now under construction is expected to begin operation late this year, bringing total station capacity to 400,000 kw. Owned and operated by the Appalachian Electric Power Co., an AGE subsidiary, the $46 million plant will burn about 1,080,000 tons of coal a year, originating from southern West Virginia coal fields. Embodying the latest skills in engineering, research and design, it will become one of the most economical producers of electricity in the nation. Already first in generation among all the private electric utility systems in the country, the AGE System now has a capacity of 3,219,000 kw with the addition of the first Kanawha unit. Another 920,000 kw is under construction, including the second Kanawha unit.

International Harvester Uses Strippings for Machine Tests

International Harvester Co. has completed arrangements with the Huntsville-Sinclair Mining Co., under which Harvester will occupy as a testing ground the site of the former Huntsville-Sinclair strip coal mine, near Huntsville, Mo., to carry on large-scale testing oper-

designed for higher production

LOWER IN COST . . . EASIER AND SAFER TO USE

Outstanding performance features make PROX Coal Cutting Equipment leaders in the industry today! PROX cutter chains, tool steel bits and bars set an impressive record in higher production at lower cost. Chemically treated pins and bushings resist rust and corrosion. Prox Chains, fast and smooth operating, mean less breakage and down-time. Equipment made by Frank Prox Company means lasting dependability and efficiency.

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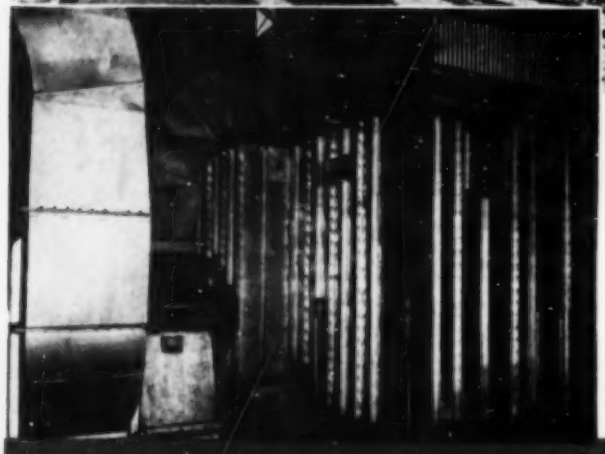


At the Itmann Plant of Pocahontas Fuel Co., Pocahontas, Va., dust is captured at the air plant (left) in Pangborn Dust Collectors.

Close-up of Pangborn Dust Collector operating within plant.

For more profitable coal preparation

look to

PANGBORN DUST CONTROL

More mechanization and more production have helped the coal industry meet industry's vastly increased demands over the past decade. But they have created a serious problem for coal processing plants. If *you* face this problem—it will pay you to look to Pangborn Dust Control for the answer!

Pangborn Dust Control traps dust at the source—at tipples, dry cleaning, de-dusting and other operations. And Pangborn Dust Control saves you money, pays for itself by . . . (1) improving the reclamation of valuable dust . . . (2) lowering plant maintenance costs . . . (3) increasing the life of your machines because they operate in a cleaner atmosphere. What's more, higher morale and better health of employees mean increased production.

If you're losing profits because of excessive dust, let Pangborn engineers conduct a free Dust Pocket Survey. It costs you nothing but can mean big savings. Write today for details and your free copy of Bulletin 909A. Just address: PANGBORN CORPORATION, 2800 Pangborn Blvd., Hagerstown, Maryland.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn DUST CONTROL

STOPS THE DUST HOG from stealing profits

ations of Harvester machines. The property, to be leased for 10 yr, will provide approximately 9,300 acres of worked-over strip-mine lands on which the company's crawler tractors and other construction machinery will be tested in leveling and other earth-moving operations. The new operation ultimately will employ about 65 persons, in addition to test engineers and management people. As a by-product of the testing, International Harvester hopes to restore to something approximating its original contour more than 9,000 acres of the worked-out mining area.

Imperial Coal Announces Fifth Scholarship Award

Imperial Coal Corp., New York, has awarded its 1953 Engineering Scholarship to Glenn Jay Learn, Nettleton, Pa., a 1953 graduate of the Blacklick Township High School, Twin Rocks, Pa. His father, L. J. Learn, is a miner employed since 1926 at the company's Imperial Cardiff mine. The scholarship, now in its fifth year, is open to employees or their sons and provides $500 annually for a 4-yr course in engineering at Pennsylvania State College. Under the scholarship plan, participants receive paid employment at the company's mines during vacation periods, which combines practical mining experience with their scientific studies, and guarantees them additional funds.

First-Aid Teams Compete in Pennsylvania District Meets

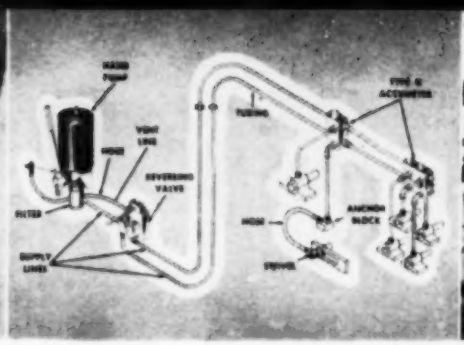
More participants for the Pennsylvania State-Wide Bituminous First Aid Contest to be held Sept. 12 were selected through additional district meets held last month. These top teams, together with other ranking teams, will compete with other teams selected in contests held earlier in the summer.

Southwestern Pennsylvania Safety Association, at Waynesburg, Aug. 15: First, Westland mine, Pittsburgh Coal Co., captained by Edward Rettinger, 99.933; second, National No. 3 mine, U. S. Steel Co., captained by J. Ray St. Clair, 99.733; third, Montour No. 10 mine, Pittsburgh Coal Co., captained by Albert Waggett, 99.600.

Central Pennsylvania Safety Association, at Portage, Aug. 1: First, Sonman Slope, Eastern Gas & Fuel Associates, captained by Frank Frytak, 99.302; second, Portage No. 2 mine, Johnstown Coal & Coke Co., captained by Joseph Kreitzburger, 99.301; third, Windber mine, Berwind-White Coal Mining Co., captained by John Boblick, 99.300.

Allegheny-Kiski Safety and First Aid Association, at New Kensington, July 25: First, Renton No. 1 team, 99.80; second, Harwick mine, Duquesne Light Co.

In addition to cash prizes ranging up to $350 for the first-place team at one meet, plaques were presented by the Mine Safety Appliance Co. and trophies by the UMWA and the National Coal Association to leading participants.



Conveyor Belt Rollers get positive lubrication with Alemite Model 6679-J lever gun. Hi-pressure delivery flushes bearings completely. Alemite loader pump fills gun easily, quickly—eliminates air pockets.

Alemite Accumeter Lubrication Systems serve hundreds of bearings from one central point—while machines are in operation—*no shutdowns necessary!* System is fully enclosed, protected from grit, dirt.

Here on 8' Shaker Assembly is lubricated with a 30 lb. capacity Alemite Bucket Pump, Model 6712. Develops 7,000 lbs. pressure. Dynamic Primer assures positive delivery of heaviest greases.

King Coal Must Roll...

from mine to car, Alemite "Friction Fighters" smooth the way!

Up a 700' Conveyor—through crusher, shaker, washer, drier—350 Tons an Hour!

Here at the Wilmington Plant of the Northern Illinois Coal Corporation a million tons of low-ash coal are processed every year, sorted in 10 sizes, and shipped. Here, in this high-speed operation, Alemite lubrication methods and equipment protect bearings exposed to hazards at every turn—dust, grit, extremes of hot and cold, wet and dry—all the dangers found in any coal processing plant.

Actual on-the-job Proof—Alemite Best for ALL types of machine motion. Chain drives, reciprocating parts, conveyor drives, all shafts, heavy or light—any and all coal processing machinery is best lubricated by Alemite. Under any conditions, there is a better Alemite method for transferring, loading or applying grease. And the proof is in the overwhelming majority of major plants that have chosen Alemite to do the job!

Alemite Slashes Downtime—Boosts Tonnage! Alemite lubrication methods of transferring, loading and applying grease reduce downtime and chances of bearing failure. Keep lubricants "refinery clean." Find out how Alemite can help you. Write Alemite, Dept. E-93, 1850 Diversey Parkway, Chicago 14, Illinois.

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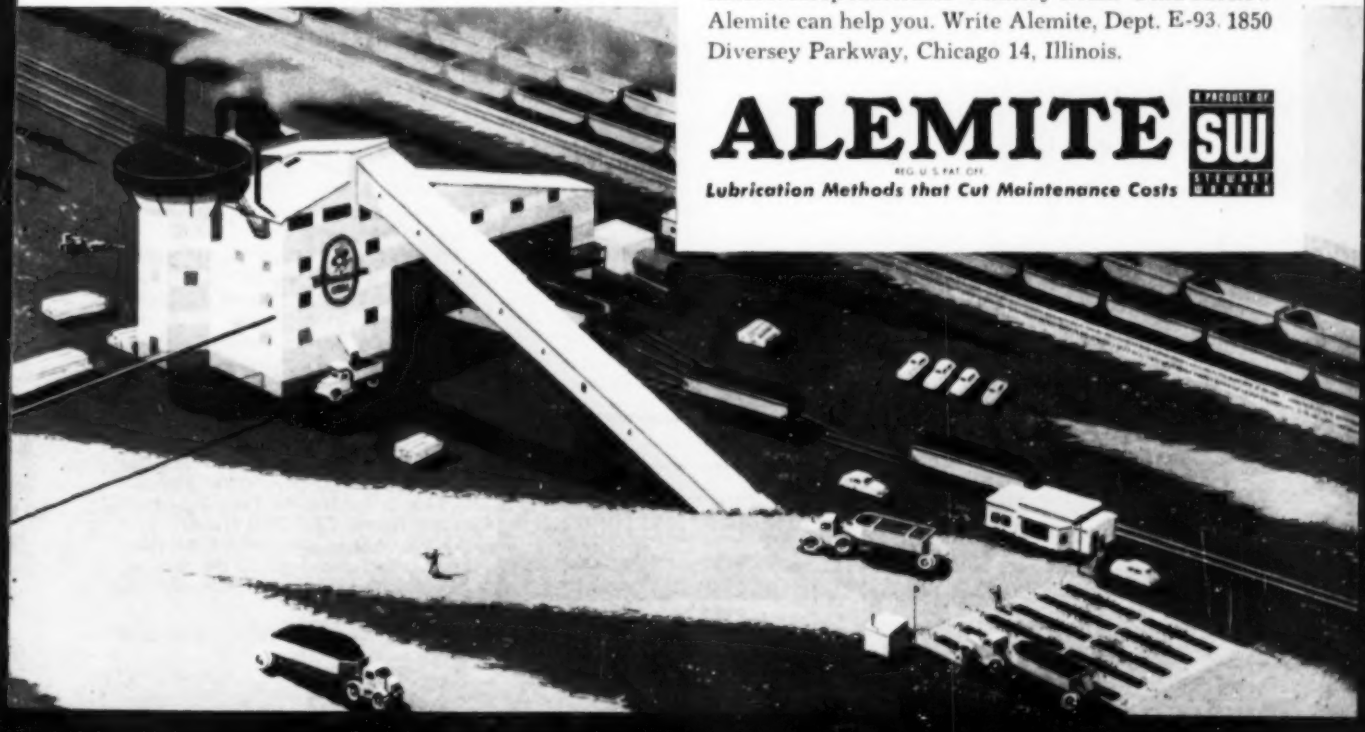
Lubrication Methods that Cut Maintenance Costs



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OSMOSE

TREATED MINE TIMBERS

This may sound like a sucker bet, but don't take the guy up on it because we can PROVE IT in one year. Here's how YOU CAN WIN the $50,000! If you deep-mine 200,000 tons of coal annually, YOU can save your company 25¢ per ton or $50,000 per year by switching to OSMOSE TREATED MINE TIMBERS NOW! No matter how you get them (see the 3 deals below) Osmose Treated Mine Timbers are impervious to all types of rot, decay and termites and LAST UP TO FIVE TIMES LONGER! Mine timbers are EXPENSIVE today, but when you compare this cost with the cost of REPLACEMENT LABOR, you begin to see why Osmose can save you such a tremendous amount. Comparable savings are possible for larger or smaller tonnages. We are VETERANS in the coal mining field and have been specialists in Mine Timber problems for years! Successful coal operators everywhere will be glad to tell you that for long range EFFECTIVENESS and real ECONOMY . . . you can't beat Osmose Treated Mine Timbers.

ALSO . . . Ask us about M-T-M (Mine Timber Mix) for spot application.

3 DIFFERENT WAYS TO SAVE

1 We can furnish you with OSMOSE TREATED TIMBERS

We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or tipple timbers from one of our treating plants. These select Osmose-treated timbers will render many years of EXTRA service.

2 We will CUSTOM-TREAT timbers furnished by you

We will Osmose-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to ANY wood species, even beech, gum, hickory, ash, elm and maple.

3 We will furnish materials and you can treat your own timber By constructing an inexpensive vat and following directions, you can treat your own green timber with OSMOSALTS.

WRITE FOR COMPLETE DETAILS on the type of Osmose service you prefer

OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.
980 ELLICOTT STREET • BUFFALO 9, N. Y.
Representatives in Pittsburgh Denver Birmingham Ala Charleston W Va and Harlan Ky

Coal-Company Earning Reports

Unless otherwise noted, earnings are for the 6 mo ending June 30, 1953, compared with the first 6 mo of 1952:

Clinchfield Coal Corp. and subsidiaries—6 mo of 1953, net profit of $928,861, or $1.19 a share, on operating revenues of $17,993,130; 1952, net of $884,598, or $1.14 a share, on revenues of $16,264,534.

Glen Alden Coal Co.—6 mo of 1953, consolidated net loss of $1,452,000; 1952 net loss, $459,000.

The Hudson Coal Co. and subsidiaries—6 mo of 1953, deficit of $1,372,370; 1952, deficit of $445,101.

Independent Coal & Coke Co.—6 mo of 1953, net loss of $261,303; 1952, net profit of $204,737.

Island Creek Coal Co. and subsidiaries—6 mo of 1953, net profit of $644,210, or 48c a share, on total income of $19,492,855; 1952, net profit of $1,712,997, or $1.38 a share, on total income of $22,647,928.

Lehigh Coal & Navigation Co.—6 mo of 1953, net profit of $132,000; 1952, net of $808,726. (Earnings for full year will approximate $1,800,000, according to Robert C. White, president.)

Pennsylvania Coal & Coke Corp. and subsidiaries—6 mo of 1953, net profit of $304,933; 1952, net of $153,454.

Philadelphia & Reading Coal & Iron Co.—6 mo of 1953, net loss of $546,351 of sales of $28,720,715; 1952, net profit of $1,001,064, or 71c a share, on sales of $34,369,946.

Pittsburgh Consolidation Coal Co.—3 mo to June 30, 1953, net of $3,016,967, or $1.39 a share; 1952 quarter, net of $2,973,645, or $1.37 a share. Net per share for the first half of 1953 was $2.77, against $2.87 for the first half of 1952.

Pittston Co. and subsidiaries—6 mo of 1953, net of $950,636, or $1.50 a share; 1952, net of $1,558,525, or $2.45 a share.

Pond Creek Pocahontas Co. and subsidiaries—6 mo of 1953, net profit of $682,554, or $2.01 a share, on total income of $11,156,452; 1952, net of $861,836, or $2.54 a share, on total income of $10,821,580.

Truax-Traer Coal Co. and subsidiaries—3 mo to July 31, 1953, net profit of $417,773, or 30c a share, on net sales of $11,593,856; 1952 quarter, net of $154,489, or 6c a share, on net sales of $9,863,300.

West Kentucky Coal Co.—6 mo of 1953, net of $821,288, or 96c a share; 1952, net of $1,115,500, or $1.30 a share.

Warner Collieries Team Tops Annual Ohio First Aid Meet

The Jensie-mine team of the Warner Collieries Co. placed first to become the Ohio first-aid champions before a crowd of over 9,000 at the annual mine safety day held in Bridgeport, Ohio, Aug. 15. Ranking second was the Piney Fork team of the Hanna Coal Co. Hanna's Dun Glen No. 2 team placed third. All three teams scored above 99 in the first aid competition. Features of the day-long

...with TYCOL lubricants on hand!

The "Big Four" of Mine Lubrication! Tycol's Engineering Service has taken another step forward in simplifying mining equipment lubrication. With an overall program: two Tycol oils and two Tycol greases to meet every requirement! Tycol Abryte 90 handles gears and transmissions – a 100% Pennsylvania oil that resists oxidation and maintains viscosity at high temperatures. Tycol Acylkup 4 is a "universal" machine grease with greater load-carrying capacity (for mine cars, too!). Tycol Arvella 65, a low-cost, general-purpose hydraulic oil, services pumps and compressors. Tycol Armitage 10, a highly stable grease, is ideal for antifriction and armature bearings. No need to stock a score of lubricants when four will do the job! And the Tycol Engineering Service is at the disposal of *all* mine operators . . . just contact your local Tide Water Associated office!

Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

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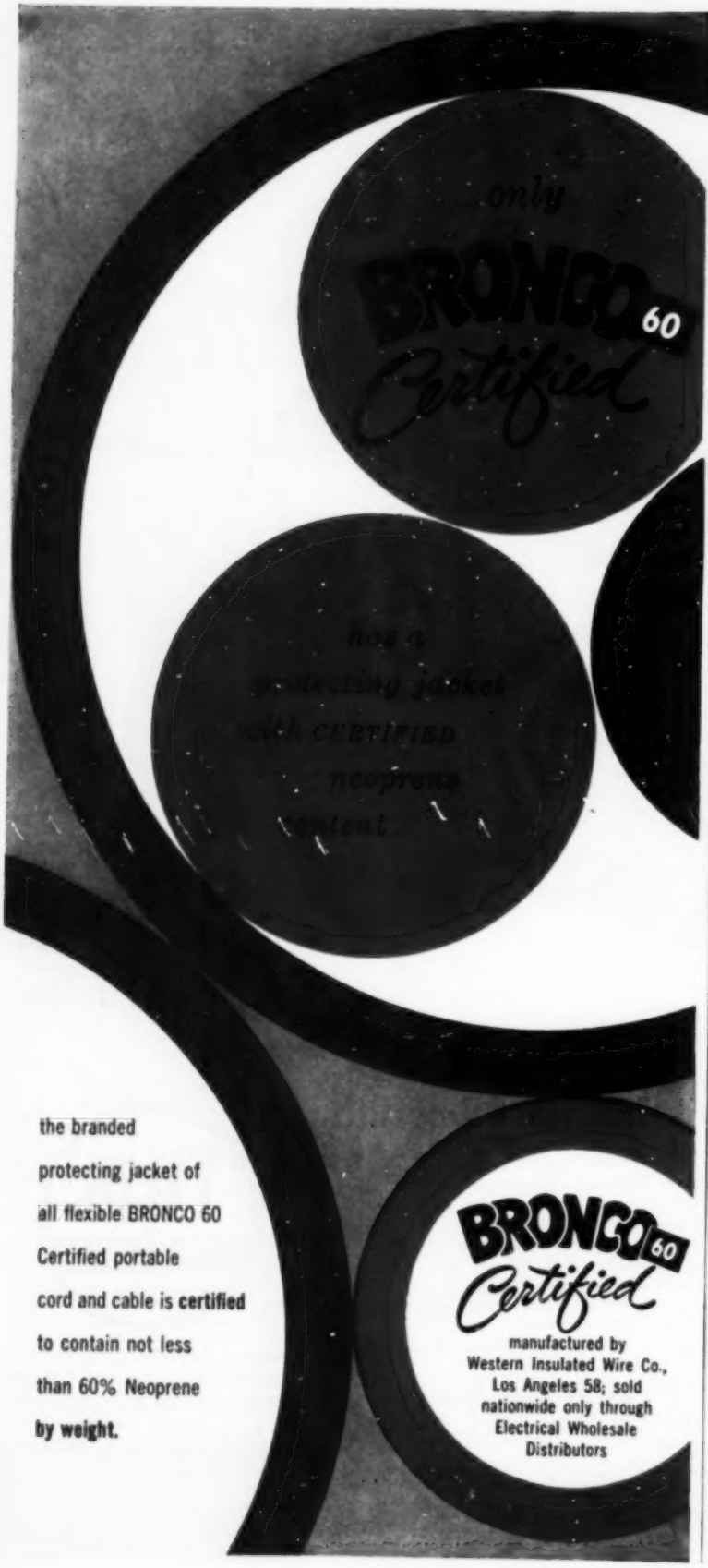


program included entertainment for all members of the miners' families attending, drawings for prizes that included a new automobile, and crowning of the "King and Queen of Safety" by "Miss Ohio of 1953." John Owens, secretary-treasurer, UMWA, was the principal speaker.

Lewis Favors Unified Labor

"Outstanding need for organized labor in the country today is unification of policy and consolidation of structure," John L. Lewis, UMWA head, told the press Aug. 11. Mr. Lewis was quoted from San Francisco during a visit "on business and about matters I don't care to comment on publicly at this time." He refused to discuss reports that he wanted to form a third major union. Although organized labor has 16,000,000 members, he pointed out, division among the various groups prevents labor from "exerting its full force economically, legislatively, or even politically." While up to the latter part of August the UMWA had not yet exercised its right to give 60-days notice of cancellation of the current contract, the union did not neglect an opportunity to take out after Joseph E. Moody, president of the Southern Coal Producers' Association. Commenting editorially on Mr. Moody's call for a new approach to industry problems to avoid "economic ruin" for southern operators, the Aug. 1 *UMW Journal* accused him "of seeking to bypass or sabotage collective bargaining." Citing Mr. Moody's speech in Charleston, W. Va., July 23 (*Coal Age*, August, p 129) as part of a "propaganda barrage," the publication said: "Problems of the so-called southern part of the coal industry are not substantially different from those of the north . . . This whole idea of a separate southern coal industry is false."

Bituminous Output Gains

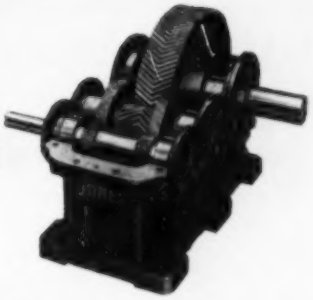
Bituminous production in recent weeks continued to whittle down its earlier losses from 1952 tonnages. Production for 1953 through the week ending Aug. 15 totaled 277,585,000 tons, a loss of 3.8% compared to the same period of 1952, according to USBM figures. A month previously, through July 18, output for 1953 was 5.5% under 1952. Output for the week ending Aug. 15, 1953, was 9,565,000 tons, 200,000 tons over that of the previous week.

BCR Widens Conference Scope

Bituminous Coal Research, Inc., announced Aug. 21 that it is expanding its widely accepted Combustion Conference program to cover a wider range of subjects. Coal industry engineers with broad experience in combustion problems will be available from BCR to lead meetings on three subjects: "The Use of Over-Fire Jets for Smoke Reduction," "Reducing Flue-Dust Emission From the Small Industrial Boiler Plant," and "Mechanical Coal and Ash Handling for the Small Boiler Plant." Part of the meetings are devoted to discussion of individual problems of those attending the conference. Groups of plant owners, engineering societies, air pollution con-

HOT MIX non-stop!

One of two new Allis-Chalmers kilns at Basic Refractories Inc. Maple Grove, Ohio plant. Dual drives engineered by Allis-Chalmers Mfg. Co. and W. A. Jones Foundry & Machine Co.



Driving a non-stop giant size rotary kiln calls for PLUS PERFORMANCE

That's why Basic Refractories selected JONES HERRINGBONE GEAR SPEED REDUCERS to drive two new rotary kilns — the largest in the world's refractory industry — at their Maple Grove, Ohio dolomite processing plant.

Operations at Basic are continuous. In processing, dead burned dolomite must be constantly *ON THE MOVE* — a drive failure could result in serious damage from the hot mixtures in the kiln.

Naturally, Basic Refractories' engineers took utmost care in the drive component selection for this important application. And, naturally, they chose JONES HERRINGBONE GEAR DRIVES because of their proven ability to stay on the job and take the 'round-the-clock, day-in and day-out punishment of continuous operation.

Giving PLUS PERFORMANCE under these and similar conditions is nothing new for any type Jones Speed Reducer — all are recognized and accepted throughout industry for all sorts of applications demanding rugged dependability, maximum capacity and quiet, smooth, power transmission.

BIG DRIVES — SMALL DRIVES — You may not have a giant kiln to drive; but when you have a power transmission job, big or small or anything in-between, your best answer is JONES . . . it has been for over 60 years.

W. A. JONES FOUNDRY & MACHINE CO. **4401 Roosevelt Road, Chicago 24, Illinois**

Ask for Catalog 70

Since 1890 . . . In the Service of Industry

Jones

LOCOMOTIVE RESISTORS

RUGGED-
RELIABLE

Have ample resistance to start locomotives smoothly on the first point and sufficient capacity for long life. No special frame construction is necessary. Just mount the units in place and connect controller leads.

Write for GUYAN Bulletins. We supply a complete line of resistance products.

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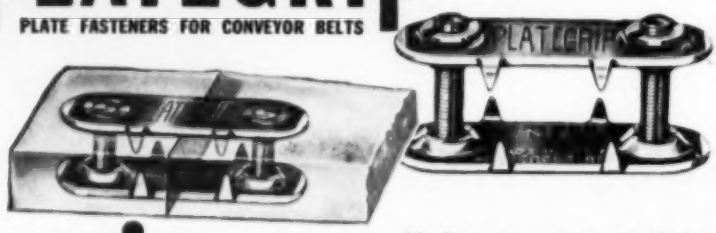
PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS



Make strong dust-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from ⅛" to 1¼" thickness. Write for Catalog Sheet.

ARMSTRONG BRAY & CO.
5340 Northwest Highway, CHICAGO 30, U. S. A.

trol officials and coal companies interested in arranging conferences in their cities are invited to contact the program coordinator, Charles H. Marks, BCR, 980 Kinnear Rd., Columbus 8, Ohio.

And for Your Information . . .

Coal shipments from Lake Erie ports this season through Aug. 10 totaled 25,584,039 tons, an increase of 2,584,113 tons over the corresponding period last year. Loading of 1,545,009 tons during the week ending Aug. 3 represented the largest coal movement of any week during the current season.

All employees of the Philadelphia & Reading Coal & Iron Co. now are being paid by check and, under arrangements made by the company, can cash their checks in any of 39 banks in the region without charge, regardless of whether they are customers of the bank. Some 2,300 employees of P&R, its subsidiaries and contractors already were being paid by check before the new plant went into effect at the end of July.

The natural gas industry continues to push its rates up. The FPC recently approved for the Texas Gas Transmission Corp. an annual increase of $8½ million in its wholesale natural gas rates affecting utility resale customers in Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, Illinois, Indiana and Ohio. For the United Fuel Gas Co., the FPC has okayed rate increases of approximately $10 million per year. A subsidiary of the Columbia System, United Fuel sells most of its gas to other subsidiaries of that system, for ultimate use in Kentucky, West Virginia, Virginia, Ohio, Pennsylvania, New York, Maryland and Washington, D. C.

In one of its first non-mining applications, a Joy continuous miner has been put to work digging a new storm sewer in Euclid, Ohio. Blasting on a tunnel for the project got so noisy a few months ago that residents forced the city to stop work until a quieter method could be found. According to reports, the machine is digging through 20 ft of shaly material per 8-hr day.

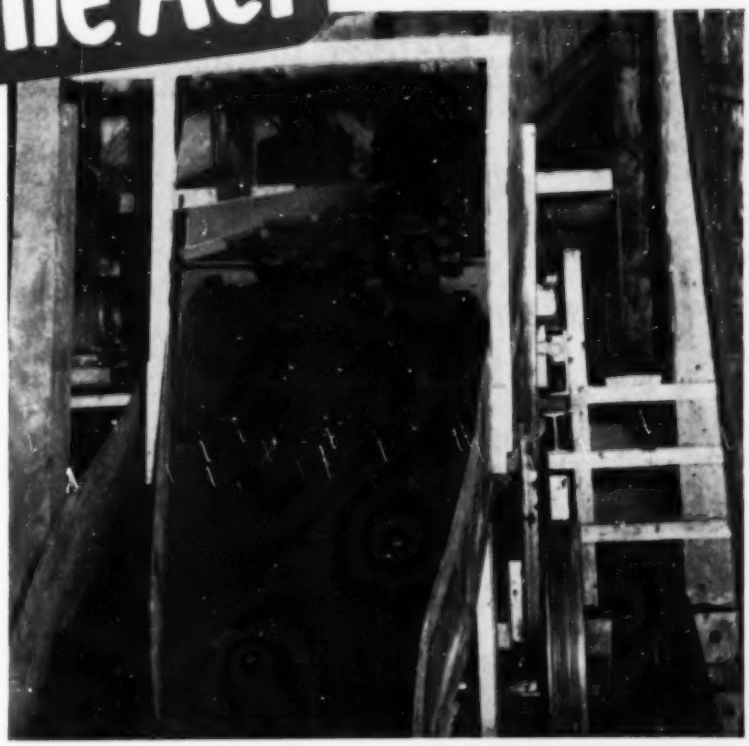
A training program designed to prepare some 50,000 foremen and supervisors a year for advancement in the profession of management has been announced by the National Association of Foremen, Dayton 2, Ohio. The 1,300 companies affiliated with the NAF will have first call on the program but plans are being made to offer it to all industry. Through its newly created department of management development the NAF will provide comprehensive supervisory training courses for first- and second-line management "trainers." Surveys show that "the greatest untapped resource of modern industry lies in developing the lower levels of management—the foremen and supervisors—into bonafide members of the management team," emphasized Dr. James E. Bathurst, NAF executive vice president.

SECO Gets in the Act

for

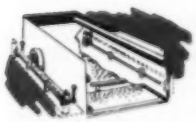
THE OHIO RIVER COLLIERIES COMPANY
Philip Sporn Plant

and Accurately Sizes Big Tonnages of Coal



480,000 tons per year of 1½" coal for one user is a big order. But it's not too big an assignment for the two Seco 5′ x 14′ double deck vibrating screens, the OHIO RIVER COLLIERIES COMPANY has on this job.

Here again, the accurate sizing, the smooth, trouble-free performance of Seco Vibrating screens are paying off with the desired production.



Seco's patented equalizer assembly

How about your operation? Are you converting your R. O. M. into the wanted sizes . . . the profit making sizes? If not, perhaps you'll be surprised to learn that you can do it for pennies per ton with dependable Seco vibrating screens. Yes, it's a fact, many progressive operators already have learned. And you can get the right Seco vibrating screen or screens to meet your exact requirements for as many sizes as you desire to make. Why miss the extra profits that clean, properly sized coal can bring you. Take the first step today, right now, and write, wire or phone for complete information.

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TRUE CIRCULAR ACTION
VIBRATING SCREENS

MODERNIZE NOW!

Get Your Share of the Market for Clean, Properly Sized Coal

Let Seco engineers show you the proven low cost per ton method of producing the sizes you want.

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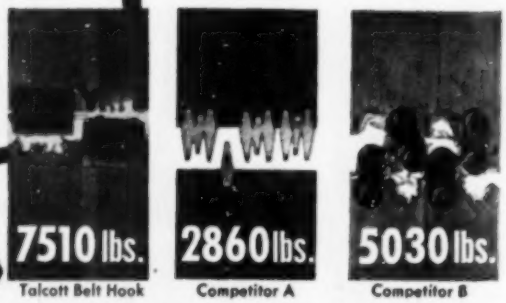
You Be the Judge of your SAVINGS

with **TALCOTT** *Belt Fasteners*



Talcott Belt Hook | Competitor A | Competitor B

At our expense convince yourself with this free test: On any individual surface conveyor belt, make a joint with Talcott Fasteners. Work it hard — then figure your savings through longer belt life without breakdowns, due to our fasteners' close pliable joint that sets records for break-resistance. Finally, multiply proved savings on this test by your total number of belts in use — and you'll have good reason to send us your order for a complete Talcott Fastener installation. Fair enough?

Send for Free Samples

Without obligation, write for free samples of Talcott Fasteners for testing. State kind of belting (leather or rubber? transmission or conveyor?), width, thickness or number of plies, extra covers or not, diameter of smallest pulley. Ask about Talcott Fasteners for patching, too.

W. O. & M. W. TALCOTT, INC. Providence, R. I.

. . . the new separable

FLEXCO HINGED BELT FASTENERS

U. S. Patent No. 2,477,833

- For joining underground extension conveyors.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates smoothly through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.
- For conveyor belts ⅜" to ½" thick.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4638 Lexington St., Chicago 44, Ill.

In the early hours of Aug. 18, 16 coal cars, 13 of them loaded, slipped their brakes in the Carbondale (Pa.) yard of the Delaware & Hudson R.R. and rolled at speeds up to 60 mph for 27½ mi to Yatesville, Pa. The runaway cars went through approximately 25 grade crossings, but there was no damage and no one was injured.

The new coke-oven battery put in operation Aug. 19 by the Bethlehem Steel Co., the first such addition at the Bethlehem, Pa., plant since 1916, will add 1,300 tons daily to the company's output. With the four existing batteries, the new unit will bring Bethlehem's total coke production to 2,300,000 tons annually, with about 8,250 tons of coal a day used by the company's coke division.

A change in the charter of the Independent Coal & Coke Co. to permit it to enter the oil and gas business is up for approval by the company's stockholders. One of several charter changes under consideration, the step would put the company in a position to take advantage of developments in the petroleum field but coal mining and sales will continue to be its primary concern, officials explained.

The currently high railroad freight rates were extended for an additional 22 mo, or until Dec. 31, 1955, under an order issued by the ICC late in July. Rate increases of 12% on coal and about 15% on most commodities in effect for some time but scheduled to expire Feb. 28, 1954, were covered by the order.

Briefs on World Coal

Great Britain—Large-size coal will be imported to Great Britain this winter from Western Europe, probably from one of the Benelux nations, to enable the British to meet their coal-export commitments. Export orders for small and fine sizes are increasing but British householders continue to prefer lump coal, which is growing scarcer as mechanized mining develops. Meanwhile, the National Union of Mineworkers has asked for an investigation of the spread between mine costs of coal and delivered prices, which average $9.10 and $17 per ton respectively.

Western Europe—The Organization for European Economic Development has announced that imports of American coal will be cut by more than half in 1953 from the 1952 total of 20,200,000 tons. The cut is attributed to increased coal production in Europe and a slackening of industrial activity.

Italy—Italian importers will buy an additional $2,000,000 worth of coal from the United States under MSA procurement authorization. Allocations will be made by the government among purchasing firms.

India—Under an agreement with the United States government, India will spend $250,000 this year for heavy earth-moving equipment for use in the lignite-mining industry. Paul Eyrich, a U. S. Bureau of Mines official, will supervise development of the mining properties.

So DIFFERENT... They're Patented!

Power Plus Anti-Rust Protection at No Extra Cost

Here are fuels so *different* they have been PATENTED—so *revolutionary* in action that they result in actual dollar savings for Sinclair users.

How? Sinclair fuels—and *only* Sinclair—contain the rust inhibitor RD-119®. This amazing chemical forms an invisible waterproof film throughout the equipment's fuel system—from fuel tank to combustion chamber. Used regularly in gasoline engines, Sinclair Gasoline with RD-119 *prevents* rust and corrosion—can save you costly repairs to carburetors and fuel pumps. Regular use of Sinclair Diesel Fuel containing RD-119 eliminates the problem of rust-clogged injectors.

Now, get *Full Power, High Anti-Knock* PLUS the *Anti-Rust Protection* of RD-119—exclusive with Sinclair... AT NO EXTRA COST! Phone your local Sinclair Representative today about Sinclair Anti-Rust Fuels.

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"there's nothing better!"
says Stan Thiess of Thiess Bros. Pty. Ltd. Australia

McCarthy Mobile-Mount Vertical Drills

● Thiess Bros. Pty. Ltd., one of Australia's largest excavating and earthmoving companies, moves approximately 10,000 tons of overburden to recover 2,500 tons of coal daily. Two sturdy, dependable McCarthy Mobile-Mounted Vertical Drills drill through shale, sandstone, slate and some hard stone strata. Drilling through overburden, ranging from 15 ft. to 50 ft. to the top of the coal seam, the two McCarthy Drills each average between 280 to 300 ft. per day . . . about 3,000 ft. in a five-day week. Best daily performance for one drill . . . 430 ft. You can realize time and money-saving results on your job. Write today for all the facts on the McCarthy Drill . . . the toughest, fastest, most efficient unit ever made.

DRILLING EQUIPMENT SINCE 1901

SALEM

THE SALEM TOOL CO.
763 SOUTH ELLSWORTH AVE.
SALEM, OHIO, U. S. A.

Anthracite to Boost Output Of Buckwheat and Rice Sizes

A survey of companies producing 75% of all the anthracite sold indicates that they expect to produce a larger tonnage of buckwheat and rice sizes in the 1953-54 coal year than was mined during the 1952-53 year, the Anthracite Institute reports. This is of particular importance to retailers, the institute points out, since the additional tonnage is considerably larger than that needed to supply all the new anthracite stokers, both domestic and commercial, to be installed during the 1953-54 coal year and retailers are thus assured of sufficient supplies of these sizes for all their existing and prospective stoker installations. The increase is possible because producers have taken steps to make output of these sizes less dependent on production of domestic sizes and have adopted practices that permit a larger production of these sizes from a given quantity of R-O-M coal, according to the institute.

Association Activities

AIME Anthracite Section Discuss Meeting Plans

Future plans were outlined at the executive committee meeting of the Pennsylvania-Anthracite Section, AIME, held last month in Hazleton, Pa., with the organization's newly elected chairman, Edward G. Fox, president, Philadelphia & Reading Coal & Iron Co., presiding. Ralph A. Lambert, president, Pennsylvania Coal Co., was appointed chairman of the society's regular fall meeting to be held Oct. 28 at Scranton. George Holland was appointed chairman for the spring meeting to be held in Hazleton, and George J. Clark, P. & R. general manager, was named chairman for the annual meeting to be held at Pottsville during the 1954 industry vacation period.

New Books for Coal Men

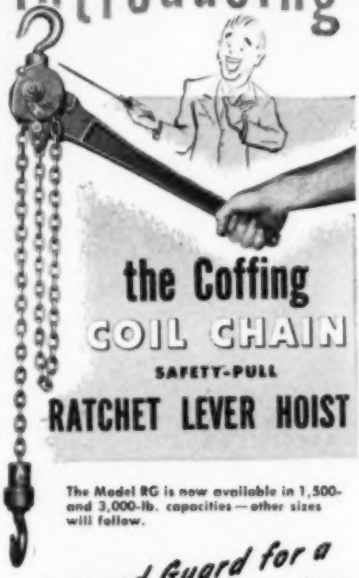
Helps in Fighting Fires

Fire-Fighting Equipment in Coal Mines—Selection, Placement and Care, by W. D. Walker Jr., William Eathorne, S. P. Polack and C. M. Keenan. Here are suggested minimum requirements for buying, placing and maintaining fire-fighting equipment for coal mines. Proposals are offered for large, medium and small operations and for three classes of fires, namely: (1) fires in solids, (2) fires in which flammable liquids are involved and (3) fires of electrical origin. *USBM, I.C. 7662. 20 pp. 8 x10½-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Safety Teamwork

Working Together for Safety: A Manual of Safe Practices. Issued in pocket size, this little booklet includes a list of

introducing



the Coffing COIL CHAIN SAFETY-PULL RATCHET LEVER HOIST

The Model RG is now available in 1,500- and 3,000-lb. capacities — other sizes will follow.

Advanced Guard for a New, Advanced Line

Here is a completely new ratchet lever hoist designed to bring you added safety and convenience. The Model RG incorporates the time-proved ratchet and pawl principle originated by Coffing — makes it hold positively at all times — no friction-type brake to slip or freeze — chain is free wheeling when not under load.

Many New Advantages

COIL CHAIN Swings or wraps in any direction for greater flexibility in use.

SIX OPERATING POSITIONS Handle operates in any position, works on full or partial strokes — for ease of handling in close quarters. Safety stops prevent spinning of handle.

BIG SAFETY FACTOR For your protection the Model RG has 100 percent overload safety factor, although the warranty covers only up to rated capacity. "Safety-valve" handle bends at point of maximum safe overload.

SIMPLE TO SERVICE The Model RG may be completely disassembled with only a screwdriver for easy servicing. Not necessary to return it to the factory for repairs.

Find out more about the hoist that gives you greater convenience and safety in all lifting, pulling, stretching. Write for Bulletin G9R.

COFFING HOIST COMPANY
Danville, Illinois

Quik-Lift Electric Hoists • Hoist-Alls • Load Binders
Mighty-Midget Pullers • Spur-Geared Hoists
Differential Chain Hoists • I-Beam Trolleys

Sold by Industrial Distributors everywhere

tipple tender

HUGE tonnages of ore are loaded into cars at this tipple. Cleaning up spillage was a problem before the "PAYLOADER" arrived. Now, equipped with a special tunnelled bucket this agile tractor-shovel straddles each rail and cleans up neatly between and outside of the tracks, piles the ore to one side and then loads it into the cars as they approach the tipple.

This is one of many ways "PAYLOADER" versatility and flexibility is being utilized by the mining industry to lower the cost of production. These unique Hough-built machines are complete integrated tractors-with-shovels, having proper built-in balance and weight distribution, multiple speeds in reverse as well as forward and other outstanding advantages for faster, better, digging, stripping, loading, carrying and dumping. "PAYLOADERS" are available in a wide range of sizes and models up to 1½ cu. yd. bucket capacity — are sold and serviced by a nationwide group or responsible, experienced Distributors. The Frank G. Hough Co., 735 Sunnyside Ave., Libertyville, Illinois.

WRITE for literature on any **PAYLOADER®** tractor-shovel: Model HA — 12 cu. ft.; Model HAH — 15 cu. ft.; Model HE — ½ cu. yd.; Model HF — ¾ cu. yd.; Model HY — 1¼ cu. yd.; 4 wheel drive Model HR — 1 cu. yd. and HM— 1½ cu. yd. There is no obligation.

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

"The use of LUBRIPLATE in the worm-gear, hypoid and two speed axles has enabled us to change our oil-change period from 15,000 miles to 40,000 and sometimes more. Our overhaul periods are stretched from 50,000 to 100,000 miles and repair parts bill cut 50%!"

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

general safety rules, plus special sections on safety with power tools, hand tools, machine operation, clothing, materials handling, electrical equipment, gas cylinders and compressed air. It's attractively printed and illustrated in two colors. *32 pp. 3¾x7-in; paper. For single-copy and quantity prices, inquire of National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.*

Safety Around the World

Safety in Coal Mines. This is a detailed summary of frequency and causes of accidents in principal coal-mining countries together with a survey of law and practice in those countries. *266 pp. 6½x9½-in; paper. $1.50, International Labor Offices, 1262 New Hampshire Ave., Washington 6, D. C.*

The Story on Mine Explosions

Coal-Mine Explosions and Coal- and Metal-Mine Fires in the United States in 1950, 1951 and 1952, by W. J. Fene and H. B. Humphrey. In the 3-yr period, 68 explosions caused 181 fatalities, this report shows. To reduce the hazards, the booklet recommends closer attention to electrical installations, better ventilation, effective rock-dusting, permissible explosives or blasting devices, and a ban on smoking in all underground mines. *USBM, I.C. 7661. 13 pp. 8x10½-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Open Hearth v Electric Furnace

Comparative Economics of Open-Hearth and Electric Furnaces for Production of Low-Carbon Steel. This study, sponsored by The Electric Furnace Survery Group comprising Bituminous Coal Research, Inc., and 14 electric utility companies, concludes that the steel and coal industries could stabilize production at a higher level and save or make several million dollars if electric furnaces were substituted for open hearths in making low-carbon steel. Gains would be in the order of $3.15 per ton of steel, a 12% increase in the use of electricity and a 25-million-ton-per-year increase in coal production. *77 pp. 8½x11-in; paper. $10, Bituminous Coal Research, Inc., First National Bank Building, Pittsburgh 22, Pa.*

Coal-Industry Bargaining

Experience Under National Wage Agreements: The Bituminous Coal and Flint Glass Industries of West Virginia, by G. G. Sommers. An economist traces the development of industry-wide bargaining and analyzes its effect on the industries and people affected. *West Virginia Business & Economic Studies, Vol II, No 4. 82 pp. 8½-10-in; paper. No price quoted. Bureau of Business Research, West Virginia University, Morgantown, W. Va.*

Pump Fundamentals

Pumps: Types, Selection, Installation, Operation and Maintenance, by F. A. Kristal and F. A. Annett. (2nd edition) Updating the first edition, in 1940, this new book covers today's pumping equipment and gives attention to new designs,

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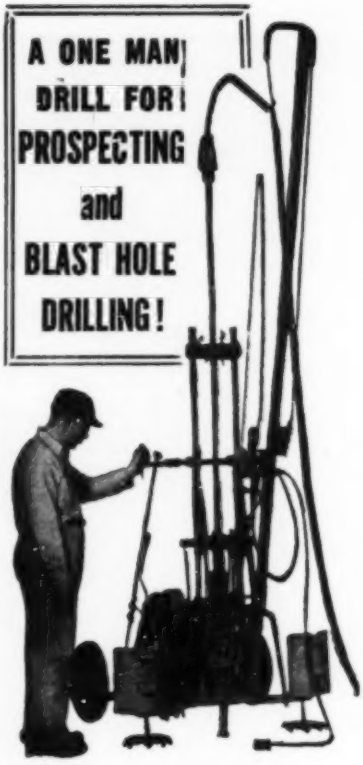

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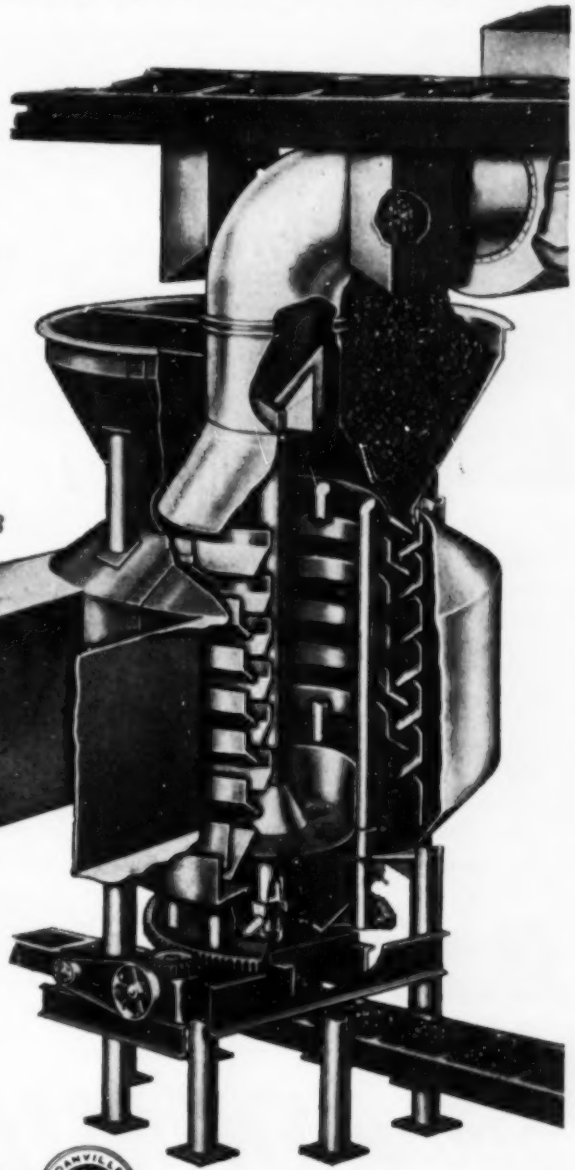

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materials and applications. You'll find descriptions of the latest advances in diaphragm, proportioning, self-priming, regenerative turbine, rotary, jet and other types of pumps. *373 pp. 6¼x9½-in; cloth. $6.50, McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.*

Other Books and Booklets

Coal Resources of Colorado, by F. D. Spencer and M. I. Erwin. U.S.G.S., Circular 258. 17 pp plus map. 8-10½-in; paper. Free, The Director, Geological Survey, Washington 25, D. C.

Scientific Research As It Proceeds in Mellon Institute, Annual Report Series, No. 40. 52 pp. 8½x-11-in; paper. Free, Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.

The following USBM publications may be obtained free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8 x 10½-in; paper; mimeo.

Mine-Timber Preservation by the Collar Method, Progress Report 1, by Edward Roberts. 14 pp R. I. 4980.

The Thermodynamics of Combustion Gases: Temperature of Methane-Air, Propane-Air and Ethylene-Air Flames, by R. W. Smith Jr., John Manton and S. R. Brinkley Jr. R. I. 4983.

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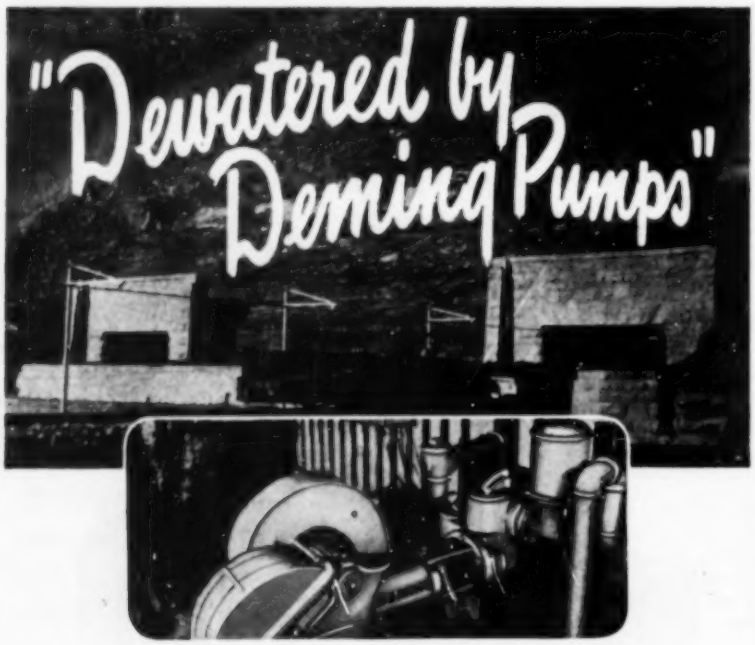

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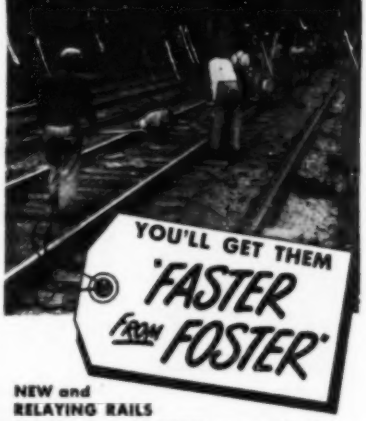

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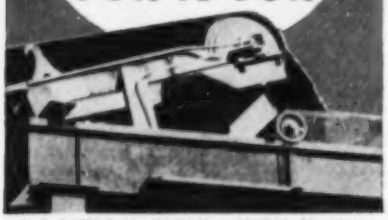

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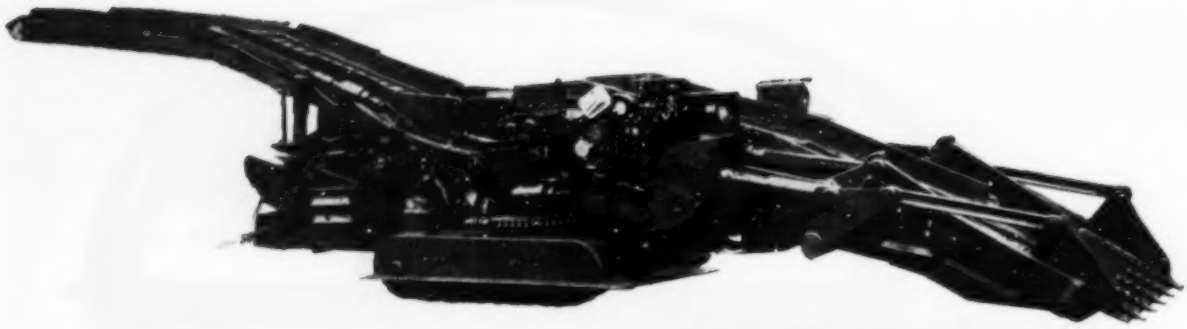

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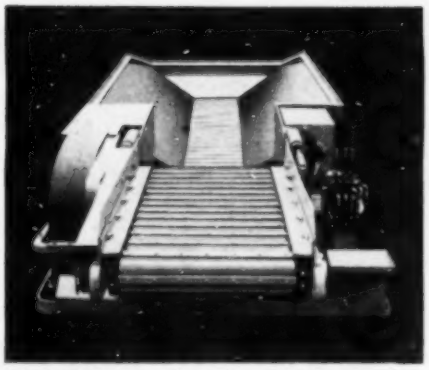

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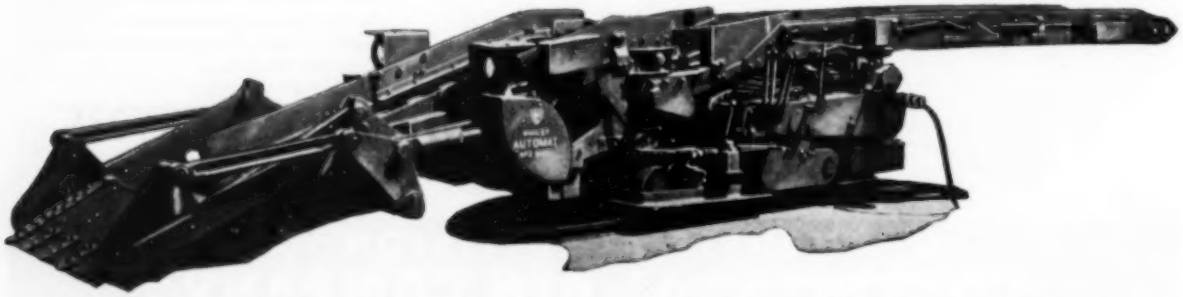

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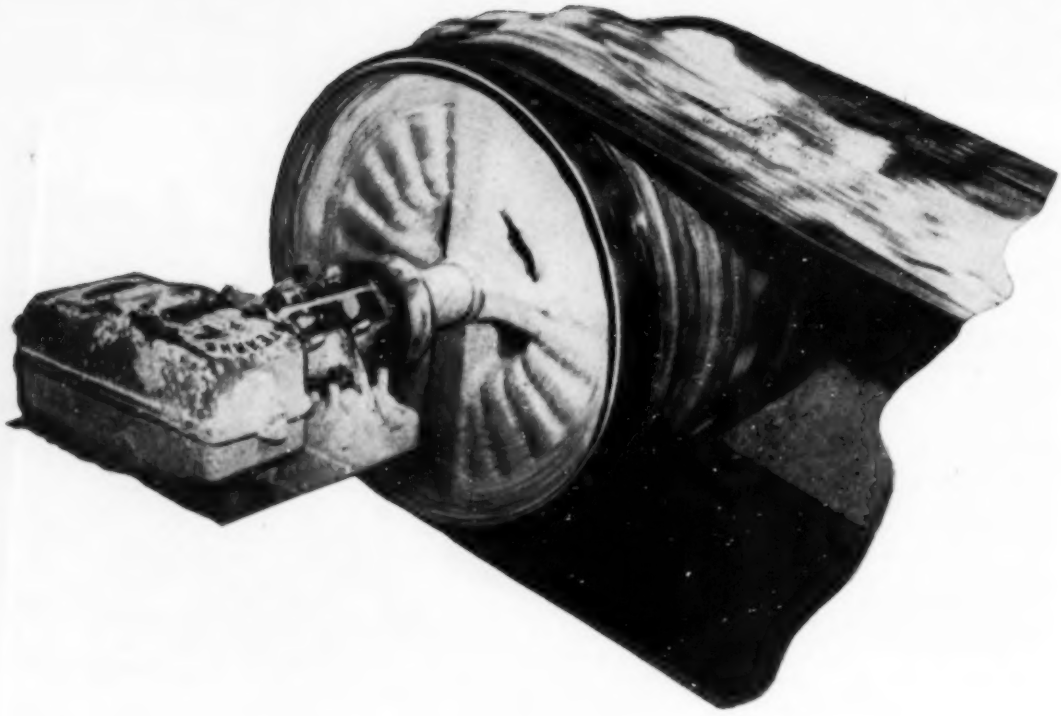

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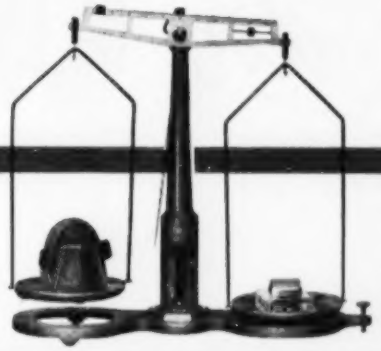

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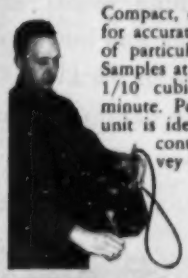

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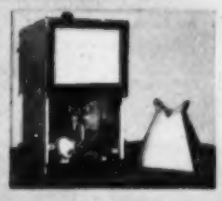

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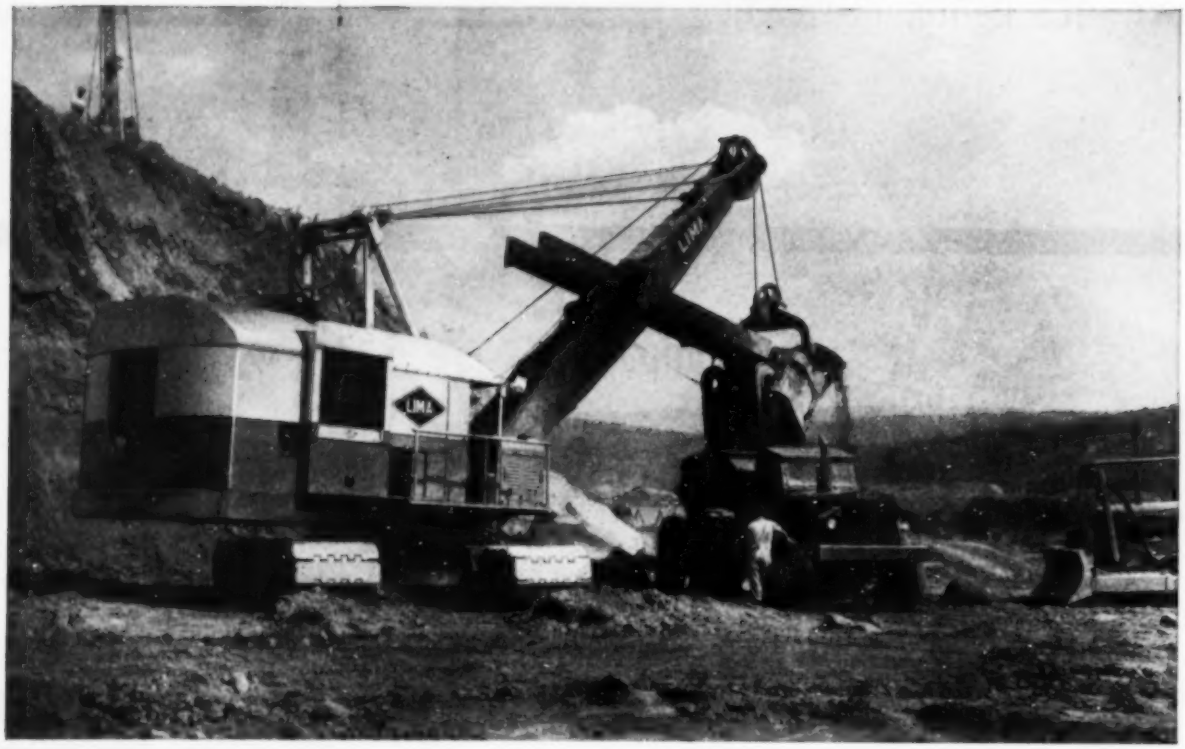
3 or 3½ yd. capacity



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Facts prove the economy of RUST-OLEUM®

Apply Directly Over Sound Rusted Surfaces

Just scrape and wirebrush to remove rust scale and loose particles — then brush Rust-Oleum 769 Damp-Proof Red Primer *directly over sound rusted surface.*

Lasts Longer Applied Directly Over Rust

Sandblasting, chemical pre-cleaning and other costly preparation methods are *not* usually required. Rust-Oleum penetrates the rust to bare metal, incorporating the rust particles into the coating.

Many Colors, Including Aluminum, and White

Rust-Oleum finish coatings incorporate the same basic rust-inhibiting vehicle as Rust-Oleum 769 Damp-Proof Red Primer. They provide *double protection* and enable you to beautify as you protect.

Practical Answer to Your Rust-Producing Conditions

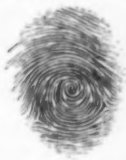
Rust-Oleum resists rain, snow, heat, fumes, sun, salt water, and chemicals. So easy to use by brush, dip, or spray that one man often does the work of *two.*

Proved Throughout Industry for Over 25 Years

Indoors and out, Rust-Oleum has *proved* its capacity to stop rust! Rust-Oleum can do the same for your tanks, metal sash, stacks, girders, roofs, buildings, machinery, pipes, etc.

An Exclusive Formula

Rust-Oleum is *distinctive* as your fingerprint. It incorporates a specially-processed fish oil vehicle that *dries,* is *odor-free,* and is formulated in *many colors.* Specify Rust-Oleum — accept no substitutes.



There Is Only One Rust-Oleum

RUST-OLEUM STOPS RUST!

ATTACH TO YOUR LETTERHEAD — MAIL TODAY!

RUST-OLEUM CORPORATION
2463 Oakton Street, Evanston, Illinois

- ☐ Have a Qualified Representative Call
- ☐ Free Survey
- ☐ Complete Literature
- ☐ Nearest Rust-Oleum Industrial Distributor

All business is specialized

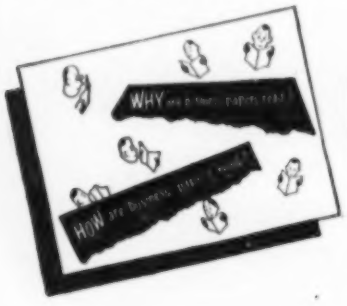
. . . and nothing specializes on your business like your business paper

Here's a profit-wise peddler; he picks his corner, not for crowds but for customers. His business is *specialized.* Like yours.

One thing about specializing is the time it saves. Take your business reading. Where else could you find, fast, the vast flood of specific facts, the up-to-the-minute information about new products, materials and methods to keep you posted on your particular field? Much of what you want isn't published *anywhere* else except in this business paper of yours. Its business is to specialize in *your* business . . . to gather, sort out, report and interpret the facts you need.

What's more . . . look at the ads. It may be news to you, but advertisers are spending over $300,000,000 this year to report on their products and services in specialized *business* papers. Your share of that investment is here, in the pages of this paper of yours. Nowhere else can you find such a complete and factful source of everything you need. Time saver? It can be a job saver, a profit saver, a life saver! Read it thoroughly—cover to cover . . . and put it to work!

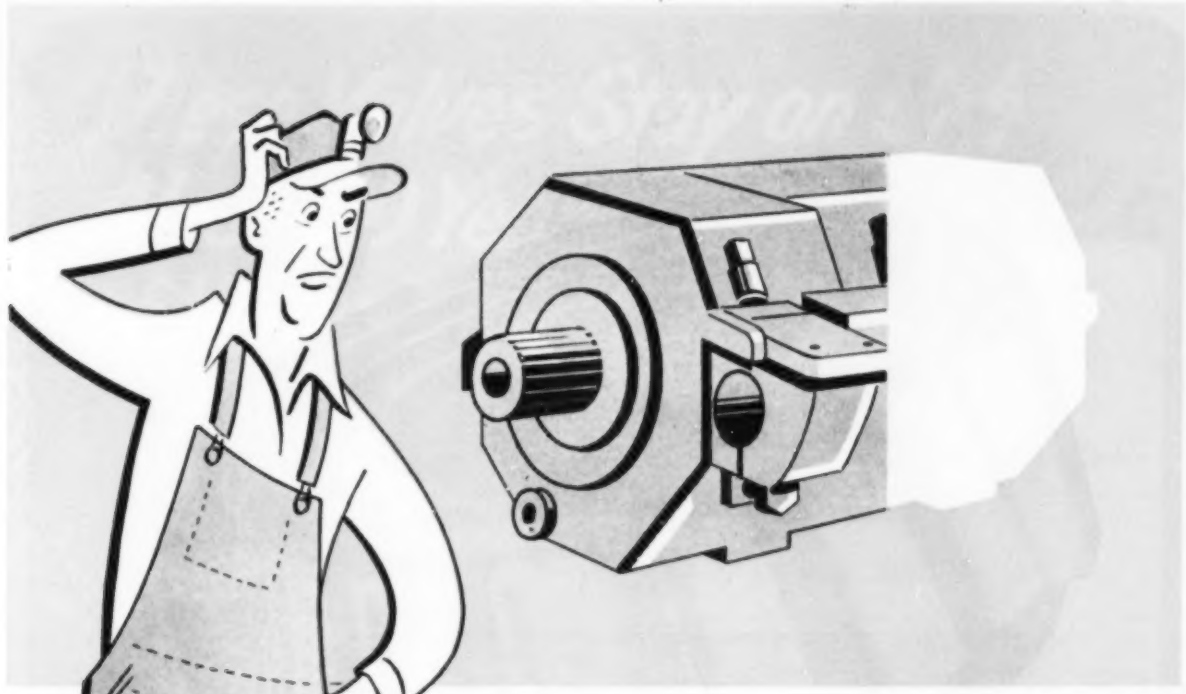
This business paper in your hand has a plus for you, because it's a member of the Associated Business Publications. It's a paid circulation paper that must earn its readership by its quality . . . And it's one of a leadership group of business papers that work together to add new values, new usefulness, new ways to make the time you give to your business paper still more profitable time.



A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet." Room 2710.

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd St., New York 36, N. Y.

One of a series of advertisements prepared by THE ASSOCIATED BUSINESS PUBLICATIONS



What can you do ... with half a motor?

When you write an order for coils for a motor with a mechanical defect *you write an order for trouble* . . . unless the mechanical defect is repaired at the same time.

It's poor economy to condemn a new or usable winding to a short life by failing to correct questionable bearings, shafts, mechanical fits and alignments.

All three big National shops are equipped to make your motors right *mechanically* as well as *electrically*. We can do any electrical or mechanical work on your locomotives, shuttle cars or other electrically-operated equipment.

Thus National corrects the trouble *and the source of trouble*. That means money in your pocket.

The National field man near you can show proof. Call him, or drop a card to us if you don't know him.

NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U. S. A.

ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION—
REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES

ALWAYS ALWAYS ALWAYS

Replace a Timken Bearing with Another Timken Bearing

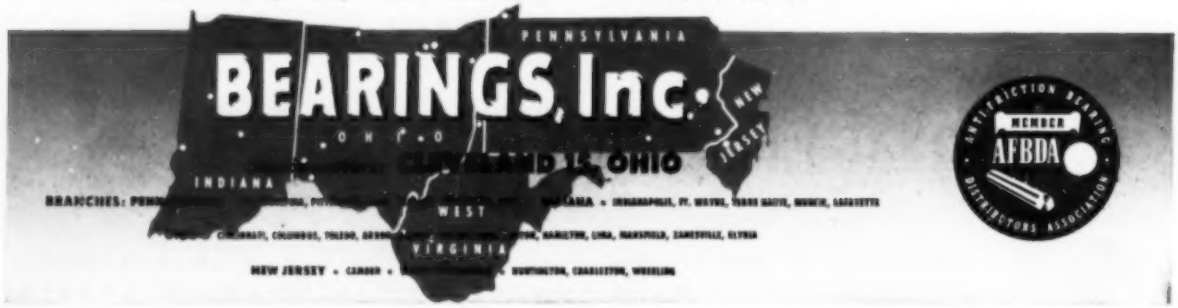
BEARINGS, Inc. always makes certain that their shelves are well stocked at all times with the complete line of famous Timken Bearings. The constant demand for Timken Tapered Roller Bearings is proof of their dependable performance.

Modern machinery designers are constantly developing new designs of earlier models, but throughout all these changes they continually specify Timken Bearings for their unmatched quality and dependability.

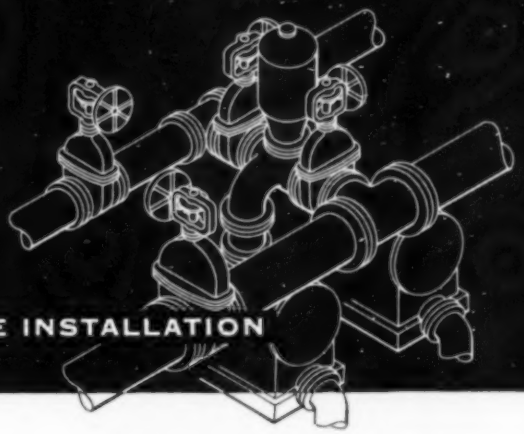
Timken Bearings carry radial, thrust and combined loads while holding vital moving parts in correct alignment. These are important factors in efficient machinery operation.

When a bearing needs replacement, always replace a Timken Bearing with another Timken Bearing. To be sure of getting the best in bearings, look for the trademark "TIMKEN" on each cup and cone.

FREE! AFBDA BEARING MAINTENANCE REPORT, a digest published regularly giving all information, old and new, on proper maintenance and service. ASK FOR IT TODAY!



These Valves Stay on Job After 50 Years of Water Service



THE INSTALLATION

At the Beaumont City Water Works, Beaumont, Texas, with Crane gear-operated iron body gate valves in main lines in pumping plant.

VALVE SERVICE RATINGS

SUITABILITY:	Always reliable
FEATURES:	Rugged design in every part
MAINTENANCE COST:	Routine care only
SERVICE LIFE:	Still in service—since 1903
OPERATING RESULTS:	No valve failures
AVAILABILITY:	Crane Catalog item—Current No. 461

THE CASE HISTORY

Beaumont taxpayers are still benefiting by the valve quality specified for the Municipal Pumping Station built in 1903. These 14, 16, and 24-inch Crane iron body gate valves remained in their original location until the old plant was converted recently from steam to diesel power. Even then, many were merely cleaned up and put right back in service in the new plant.

For 50 years and more, these Crane valves have given outstanding service at the lowest possible maintenance cost. With but routine care, they remained tight at seat and stem, and always performed with smooth, positive action, despite infrequent operation.

Here's an example of the quality that traditionally sets Crane apart from ordinary valves. It's value like this that has always made Crane the first choice of thrifty buyers in every industry.

THE VALVE

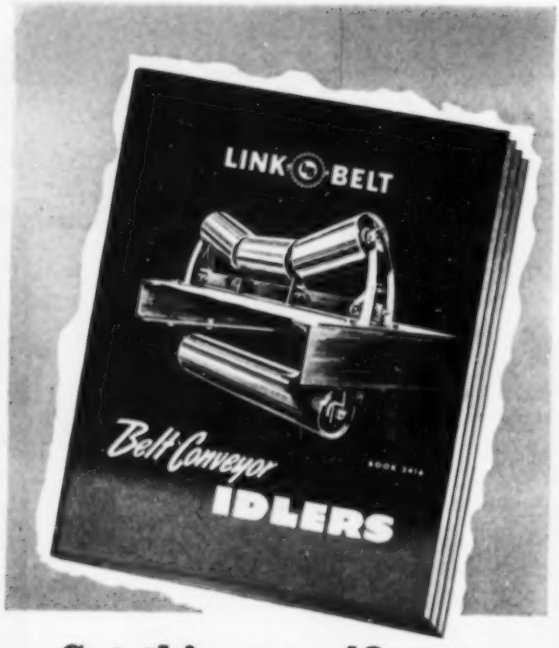
Today's Crane 125-Pound Iron Body Gate Valves with wedge disc are building equally outstanding service records. Highly engineered for durability and dependability at low cost, these valves are now available in the most complete line of patterns and sizes, with a choice of trim for water utilities and other services. Choose to your exact needs from your Crane Catalog, or see your Crane Representative.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING



Get this new 48-page idler data book

Here's complete information on industry's most comprehensive line

COVERS Link-Belt's entire roller bearing idler line of 34 types in seven basic designs. Includes all the facts you need for ordering and application: dimensions and specifications, selection and spacing data, recommended lump-sizes, accessory information. Get your copy of Book 2416 today. Use the handy coupon below.

LINK-BELT

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BELT CONVEYOR IDLERS

LINK-BELT COMPANY
Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

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Please send me immediately a free copy of your 48-page Idler Book 2416.

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Position .....
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for primary coal crushing with minimum fines

GRUENDLER COAL CRUSHERS—

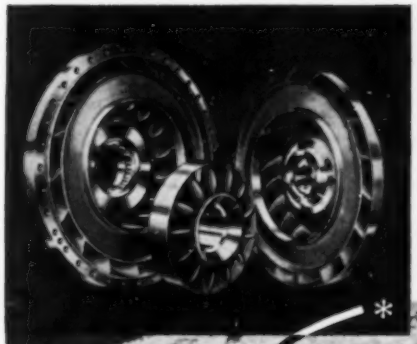
with three-way action — impact, shear and compression — split coal lumps without excessive fines.

The Slow Speed Gruendler Crushers make maximum use of power, have fewer working parts and therefore require less maintenance. Positive tramp iron relief eliminates expensive breakdowns due to introduction of foreign material in the crusher. Write for complete details of the Gruendler Coal Crusher . . . no obligation.

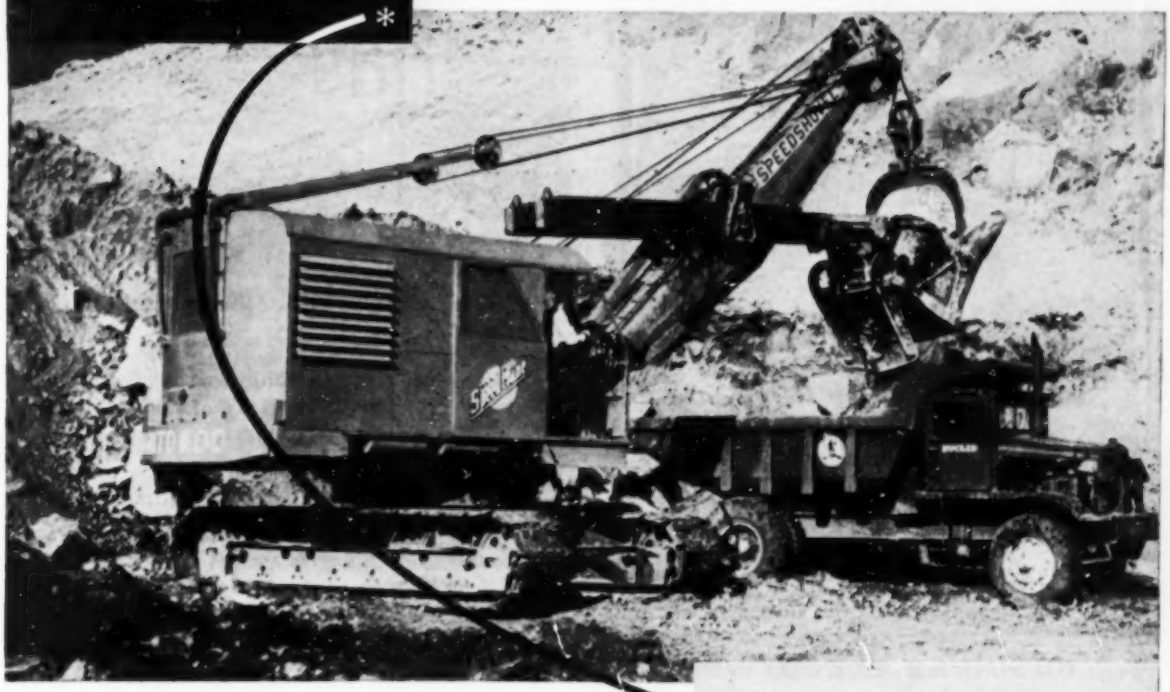
COAL SAMPLE CRUSHER

Laboratory Coal Sampler and Riffle Bucket, approved by U. S. Bureau of Mines, enables you to obtain accurate coal samples to make final analysis of your coal. Write for information.

GRUENDLER CRUSHER & PULVERIZER CO.
2917 N. MARKET ST. • SAINT LOUIS 6, MO.



Eventually EVERY Shovel Will be TORQUE CONVERTER Driven But You Can Profit by its advantages NOW with a MANITOWOC



Get *extra* yardage, higher daily output, faster cycles, more bail pull, less breakage, smoother operation with a TORQUE CONVERTER equipped MANITOWOC.

Gives you *extra* power for tough going — smoother, faster acceleration throughout the entire cycle — enables you to handle bigger loads, shock loads, jars and jolts without damage to mechanism.

It's the greatest advancement in shovel history — and it's yours NOW, in the Manitowoc line. Manitowoc pioneered this development — more than twelve years ago — hundreds of units now operating. The big swing is to the mighty Manitowocs — Torque Converter driven. Get complete details from Manitowoc Engineering Corp., Manitowoc, Wisconsin.

* BALANCED POWER

Engine operates at maximum efficiency at all times — full engine power for full loads — just enough power for light loads — automatically selected. Engine cannot be stalled — no delays waiting for engine to pick up speed.

SMOOTHER OPERATION

Oil cushion absorbs jolts and jars. Saves cables, clutches, gears and assemblies. Less down time means more yardage.

PRECISE CONTROL

"Fraction of inch" control by either hand throttle or foot accelerator, without slipping clutches or shifting speeds. Makes an expert out of an average operator. Ideal for crane service, setting steel and stone, and general erection work.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

this man has ice water in his veins!

Of course he'd never volunteer to give blood, anyway. But any resemblance of this old duffer to the average, red-blooded American is a mistake.

For instance, several million healthy Americans have given blood. *But it's not enough.*

So this is to tell several million more Americans that their blood is needed—now!

We've never let anyone down who was in trouble. When a GI gets wounded and suffers *shock*—he's in bad trouble. He's got to have blood and lots of it! Folks here at home need blood too—to save their lives.

So make a date with your Red Cross, Armed Forces or Community Blood Donor Center. *One* hour and you're on your way.

BUSINESS EXECUTIVES CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLANT BULLETIN OR HOUSE MAGAZINE?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOODMOBILE MAKE REGULAR VISITS?
- ◯ HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

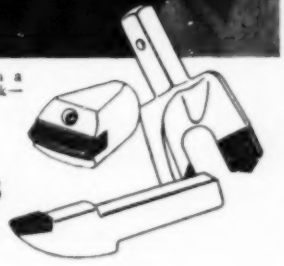
Remember, as long as a **single** pint of blood may mean the difference between life and death for **any** American . . the need for blood is **urgent!**

GIVE BLOOD

...give it again and again

NATIONAL BLOOD PROGRAM

Grinding a carbide-tipped tool with a Norton green CRYSTOLON wheel is fast work—and good!



Grind tools with the "TOUCH OF GOLD"

When you're grinding with a Norton K-Bond green CRYSTOLON* wheel, you have the "Touch of Gold." You add value to all your carbide-tipped tools. They stay sharp longer and help you get out more tonnage.

Long tool life, low sharpening cost will result from the use of Norton green CRYSTOLON abrasive, a special silicon carbide. You get fast, cool, free cutting at every turn of the wheel—and long wheel life in the bargain. You can specify exactly to your own individual needs, too. The vitrified K-Bond is so closely controlled that you can get wheels of half-grade increments of hardness.

Investigate green CRYSTOLON wheels. They'll do better on all your carbide bit grinding.

Ask Your Norton Distributor for Help...

in selecting your wheels. He has wide experience in grinding in the mining field—and he can call in a Norton abrasive engineer any time. This assures you the right wheel for every job. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES
Making better products to make other products better

WHY IT PAYS TO SALT YOUR COAL!

YOU SELL *MORE* COAL
You Serve Your Customers Better —and it Costs You Nothing!

You and your customers *both* gain when coal is treated with STERLING *Auger-Action* ROCK SALT. Saves time and money, at both ends. Your dealers and industrial customers gladly pay the few pennies it takes to treat a ton of coal. They know rock salt costs far less than labor, or demurrage charges.

You gain, too—with faster turnaround of cars. No freeze-ups. Rock salt keeps 'em rolling—with *payloads*. You ship more coal with fewer cars. And here's how easy it is to use STERLING *Auger-Action* ROCK SALT.

FOR ANTHRACITE—Only 5 to 8 lbs. of STERLING *Auger-Action* ROCK SALT per ton of coal.

FOR BITUMINOUS—Generally needs but 5 lbs. of STERLING *Auger-Action* ROCK SALT per ton.

DE-ICING HOPPERS—Simply spread about 75 lbs. of STERLING *Auger-Action* ROCK SALT over car floor and hopper doors. This quickly frees car of snow or ice.

Savings & Safety . . . AT THE MINE

Prevent accidents and costly delays. STERLING *Auger-Action* ROCK SALT keeps roads, tracks, scales and platforms clear of ice and snow.

SALT YOUR COAL WITH
STERLING AUGER-ACTION ROCK SALT

ORDER STERLING Auger-Action ROCK SALT in carloads, bulk or handy 100-lb. bags. NOW!

SELL MORE COAL! MAIL THIS COUPON TODAY!

INTERNATIONAL SALT COMPANY, INC.
DEPT. C-9, SCRANTON 2, PA.
Please have your representative contact me.

*Name*_____
*Company*_____
*Street*_____
*City*_____ *Zone*____ *State*_____

Rugged! Dependable! Portable!

"Our best scale buy. We set up our Thurman Portable Truck Scale wherever we need it . . . it's always accurate . . . gives us good service."

Says **Waterloo Coal Co.**
OAK HILL, OHIO

THE
THURMAN PORTABLE TRUCK SCALE

Easy to move from job to job . . . as a unit. Merely remove six bolts which hold the side levers in place, then lift scale assembly and load on a truck. In new location, it can be ready for use in minutes. No concrete footings required. Perfectly balanced for a lifetime of accuracy. Wide steel bases, at both ends; support scale firmly. Chrome-plated weighbeam.

Capacities:
20, 25 & 30 Ton
Platform Lengths:
18, 22, 24 and 30 ft.

also can be installed as a pitless scale, saving expensive pit-construction costs.

THURMAN MACHINE CO. *SCALE DIVISION* 156 North Fifth Street Columbus, Ohio Dept. B

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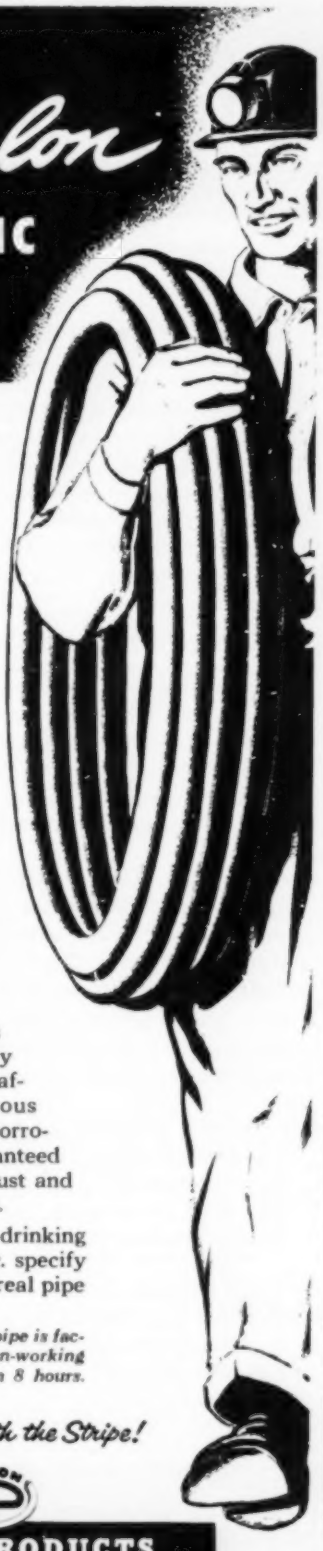
designed to Outpull, Outperform and Outlast...

This 6½ ton Monitor is designed to outpull, outperform and outlast any comparable storage battery locomotive of equal weight and battery capacity. More tractive effort, better riding qualities and longer battery life are assured by our double equalizers which exert equal pressure on all 4 wheels. Custom built to your requirements in single or double motor drive with drum, cam or contactor type controller.

GREENSBURG MACHINE COMPANY
101 STANTON ST., GREENSBURG, PA.

Carlon

PLASTIC PIPE



COSTS LESS

LASTS LONGER . . .

Lightweight . . . flexible . . . CARLON Plastic Pipe is easier to handle . . . costs less to install. Up to 400-foot coils of CARLON can be carried by one man . . . curves to follow irregular slopes and entries . . . connected without special tools to plastic or existing metallic fittings.

CARLON Plastic Pipe lasts many times longer than ordinary pipe because it is unaffected by sulphurous waters, alkalies and corrosive wastes. It is guaranteed forever against rot, rust and electrolytic corrosion.

For mine drainage, drinking water, vent lines, etc. specify CARLON! The first real pipe that is plastic.

Every foot of CARLON pipe is factory-tested at greater-than-working pressures for longer than 8 hours.

Buy the Pipe with the Stripe!

CARLON CP

CARLON PRODUCTS CORPORATION

Pioneers in Plastic Pipe

1448-CP

Canada: Micro Plastics, Ltd., Acton, Ontario • Export: W. E. Botzow, New York City

10300 MEECH AVENUE • CLEVELAND 5, OHIO

Parmanco

HI-SPEED HORIZONTAL DRILL

• Drills a 6-inch Hole in two-thirds the ordinary time •

Included in the new design is an auger rack which saves on drilling time. The augers are on the machine as it is moved from hole to hole. Another feature, for faster set up and smoother drilling, is the four individually adjustable level jacks. Automotive steering is optional.

COMPLETELY RE-DESIGNED Around a 40 H. P. ENGINE

• This HI-SPEED DRILL is designed for drilling 5 - 6 - 8 inch holes to 100 feet or more. The 40 H. P. engine with four drilling speeds makes possible the reduction of footage time by one third. This new drill, the very latest in design, is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling.

•

Send for Complete Details.

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PARIS MANUFACTURING CO.

PARIS, ILLINOIS

Double Barrel Advertising

Advertising men agree – to do a complete advertising job you need the double effect of both Display Advertising and Direct Mail.

Display Advertising keeps your name before the public and builds prestige.

Direct Mail supplements your display advertising. It pin-points your message right to the executive you want to reach – the person who buys or influences the purchases.

More and more companies are constantly increasing their use of Direct Mail because it does a job that no other form of advertising will do.

McGraw-Hill has a special Direct Mail Service that permits the use of McGraw-Hill lists for mailings. Our names give complete coverage in all the industries served by McGraw-Hill publications – gives your message the undivided personal attention of the topnotch executives in the industrial firms. They put you in direct touch with the men who make policy decisions.

Some people have a wrong conception of Direct Mail. There's no hocus-pocus to it—there's no secret formula—nor is there need for an extensive department to plan and execute your mailing program. You don't even need your own mailing lists.

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance in industrial personnel. Our lists are compiled from exclusive sources, based on hundreds of thousands of mail questionnaires and the reports of a nationwide field staff, and are maintained on a twenty-four hour basis.

In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want.

Ask for more detailed information today. You'll be surprised at the low over-all cost and the tested effectiveness of these hand-picked selections.

McGRAW-HILL
PUBLISHING COMPANY, INC.
330 WEST 42nd STREET, NEW YORK 18, N. Y.

DANDUX
BRATTICE CLOTH

easier to handle . . . won't flame . . . wears longer . . .
in two weights . . . 36" to 96" wide
of uniform quality that gives better all around protection

C. R. DANIELS, INC.
75 West Street New York 6, N. Y.

A Brattice Cloth Proofing Tank In Dandux' Own Finishing Plant

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If you need effective, highly readable, smartly illustrated company literature (booklets, pamphlets, manuals) to display your products, inform the public of your operations, attract key personnel to your plant, train employees, and perform any of the other communicative functions that are vital to your business . . .

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Diamond Core Drilling Contractors
PUNXSUTAWNEY
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Tel. 382

WE HAVE SPECIALIZED IN TESTING BITUMINOUS COAL LANDS FOR OVER 40 YEARS
GASOLINE • STEAM • ELECTRIC DRILLS
WE PRE-GROUT SHAFT LOCATIONS
HORIZONTAL DRILL HOLES FROM 3" TO 16" FOR DEWATERING MINES
OUR OPERATORS ARE HIGHLY SKILLED

WE HAVE ALWAYS GUARANTEED SATISFACTORY COAL CORES
We solicit your inquiries

CORE DRILLING
—anywhere

"We look into the Earth"

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DRILLING CONTRACTORS AND MFRS.
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. . . Here is GUARANTEED MAGNETIC PROTECTION for INDUSTRIAL and PROCESSING USES!

MAGNETIC PLATES—Std. widths 4" to 26"; Lengths and number of poles as required. Specials on order.

MAGNETIC PULLEYS—Std. diameters 12" to 30"; Belt widths from 4" to 60". Larger sizes on order.

MAGNETIC PULLEY UNITS—Pulley sizes from 12" to 30" dia., belt widths 4" to 60". Length of unit as desired.

MAGNETIC DRUMS—Std. diameters 12" to 30"; Face widths 4" to 60", with or without enclosures.

MAGNETIC PIPE DUCTS—Available in line sizes from 4" up to 12", for either air or gravity systems.

MAGNETIC LIQUID TRAPS—Line sizes to 4" for Sanitary or Industrial uses. Standard or heavy-duty models.

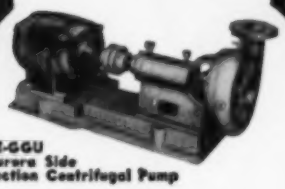
MAGNETIC HAND AND ROAD SWEEPERS—Available in Standard, Heavy-duty or Hi-Intensity Models. Sweep widths 12", 18", 24", 36", 48", 60" and 72".

SEND FOR FREE BULLETINS TODAY!

THE HOMER MANUFACTURING CO. Inc., Dept. 59, LIMA, OHIO

Serving Perfectly • A Wide Variety of Duties

A Flexible Performer Wherever Liquids are Used



TYPE-GGU
Aurora Side Suction Centrifugal Pump

Discharge may be at any of eight positions. Only the pump end need be of special metals to handle corrosives. Combines numerous quality features for extra years of service. Write for Bulletin 107-M.

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AURORA Always PUMPS

AURORA PUMP COMPANY

SUBSIDIARY OF THE NEW YORK AIR BRAKE COMPANY
92 Loucks Street, Aurora, Illinois

15 YEARS WITHOUT A BREAKDOWN!

You Can Have This Record Too!

TYPE 242

• This remarkable record of continuous service for FLOWER Brush Holders was made under the most severe operating conditions at one of the largest steel mills in the country (name on request).

FLOWER Job-Designed Brush Holders are available in more than 1000 types and are individually designed for special applications.

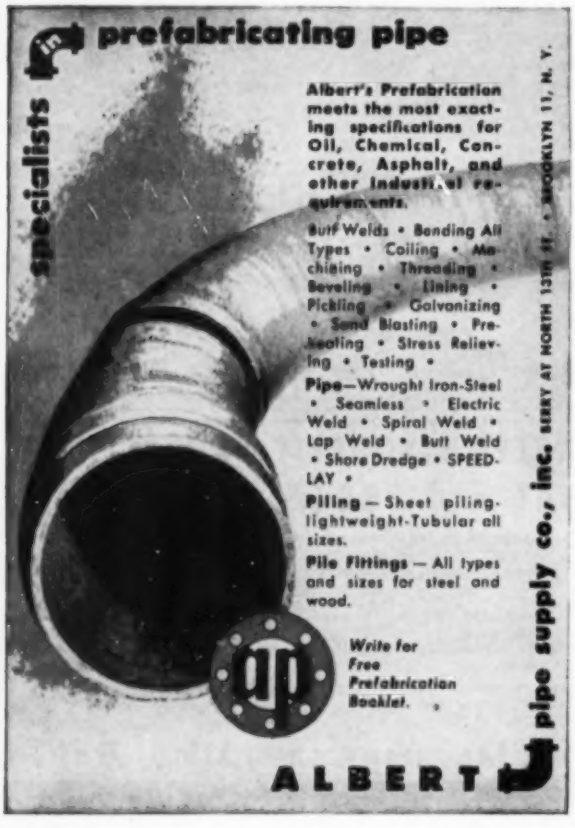
Write for Free Catalogue No. 4C

FLOWER PHILADELPHIA SINCE 1909

D. B. FLOWER MANUFACTURING CO.
1217 SPRING GARDEN ST., PHILA. 23, PA.
Pittsburgh • Cleveland • Chicago • Detroit • St. Louis • Princeton, W. Va. • Los Angeles

prefabricating pipe

specialists in



Albert's Prefabrication meets the most exacting specifications for Oil, Chemical, Concrete, Asphalt, and other Industrial requirements.

Butt Welds • Bending All Types • Coiling • Machining • Threading • Beveling • Lining • Pickling • Galvanizing • Sand Blasting • Pre-Heating • Stress Relieving • Testing •

Pipe—Wrought Iron-Steel • Seamless • Electric Weld • Spiral Weld • Lap Weld • Butt Weld • Shore Dredge • SPEED-LAY •

Piling—Sheet piling-lightweight-Tubular all sizes.

Pile Fittings—All types and sizes for steel and wood.

Write for Free Prefabrication Booklet.

ALBERT pipe supply co., inc. BERRY AT NORTH 13TH ST. • BROOKLYN 11, N. Y.

after you've read this magazine

. . . and clipped pertinent ideas, articles and advertisements for reference, *please do not burn or throw it away.*
Here are two sound reasons why:

1) Wastepaper can help to swell the funds of your local Boy Scout Troop, your church or other community organization. It gets a good price these days.

2) Whether in magazine form or not, wastepaper helps to fill the increasing need for paper pulp brought on by the mobilization effort.

Collect it. Give it to your favorite organization. Chances are they have scheduled pickups.

Core Drilling by Contract

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
$1.20 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY wanted undisplayed advertising rate is one-half of the above rate, payable in advance.
PROPOSALS, $1.20 a line on insertion.

INFORMATION:
BOX NUMBERS care of publication count as 1 line additional.
DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE:
The advertising rate is $9.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

NEW ADVERTISEMENTS: Address N.Y. office, 330 W. 42 St., N.Y. 36, for October issue. Closing September 17th.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

CENTRAL SHOP Foreman wanted—Kentucky Coal Company wants supervisor for work of rebuilding and overhauling mobile mine equipment. Graduate in Mechanical or Electrical Engineering preferred; equivalent in practical experience is acceptable. Position serves as preparation for job of Chief Electrician. In reply state age, education, experience and salary required, P 8697, Coal Age.

PRODUCT DESIGNERS AND DRAFTSMEN

Internationally prominent manufacturer of heavy machinery used in mining, crushing, cement and basic processing industries, located Midwest, has excellent opportunities for Mechanical Design Engineers and Draftsmen for research and development and new product design. Liberal employee benefits, plus exceptionally fine working conditions and opportunity for future. Write, stating experience, present employment, personal data and salary expected. Replies confidential.

P 8778 COAL AGE
520 N. Michigan Ave., Chicago 11, Ill.

Your Inquiries to

Advertisers Will

Have Special Value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publisher to secure more advertisers and—more advertisers mean more information on more products or better service — more value — to YOU.

POSITION VACANT

Wanted by western non-metallic mine: Mine General Maintenance Foreman to direct and coordinate underground mechanical and electrical maintenance program. Must be familiar with the equipment of a fully mechanized mine. Applicants should give complete information as to age, experience and references. Salary open. P 9001, Coal Age.

POSITION WANTED

W. Va. Mine Foreman desires change to Western State. Good reference. 27 years experience Rubber Belt Haulage Shuttle Car and Track. Write PW 9006, Coal Age.

BUSINESS OPPORTUNITY

For Sale or Lease

2200 acres coal land: 3 workable veins. 190' to first vein: at 250' a 10' vein: at 290' a 6' vein. First vein analysis 12867 B.T.U.'s, ash content 6%. This land is 5 mi. west of new mine at Waltonville, Ill., and joins Franklin County. Is about 70 mi. north of Joppa atomic plant. I. C. & Mo. Pac. railroads pass through this acreage, reasonable price. Added acreage can be obtained. BO 8521, Coal Age.

3-Ton Hudson Hy-Lift

GMC 1941, condition excellent, mileage 21,000, a close out.

GMC YONKERS TRUCK SALES CO.
28 New School St., Yonkers, N. Y.

WANTED IMMEDIATELY

Underground Sinking Hoist

150-200 HP 2-drum, sectionalized, to go down 5' x 5' vertical shaft.

Give us description of any hoist you have for sale.

MACHINERY CENTER, INC.
(Formerly Roger Pierce Equip. Sales Co.)
808 NEWHOUSE BLDG.
SALT LAKE CITY, UTAH

WANTED TO PURCHASE

6 S.C. or 10 S.C. SHUTTLE CARS

C.D. 26 COAL DRILLS

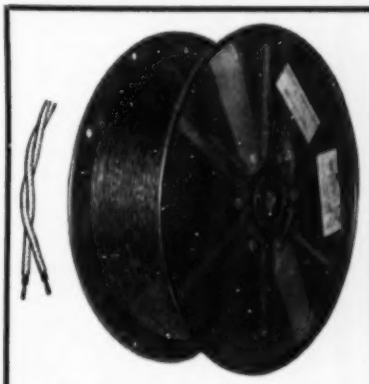
10 R.U. COAL CUTTERS

11 B.U. COAL LOADERS

250 VOLTS D.C. PREFERABLY JOY & SULLIVAN. ALSO LABORATORY EQUIPMENT FOR COAL ANALYSIS.

W8917 COAL AGE
330 W. 42 St., New York 36, N. Y.

FOR SAFETY
NEW CROUSE HINDS
EXPLOSION PROOF TELEPHONES
Immediate Delivery
At Fraction of Current Cost
$375.00 MODEL ETG-24 @ $100.00
$265.00 MODEL ETB-24 @ $ 80.00
Loud Ringing Bells Included
GENERAL TRADERS, INC.
2875 W. Grand Ave. Chicago, Ill.



U. S. Gov't Closeout

BLASTING and COMMUNICATION WIRE

$3.50 per M ft.!

approximately 1/3¢ ft.

SAMPLE ON REQUEST

Signal Corps W 110B 2 conductor, 3 copper, 4 steel, rubber and rugged weatherproof braid wire.

½ mile ..... $ 9.24
1 mile 18.48

F.O.B. Chicago

Comes on no-charge steel reels.

D. COLEMAN AND SONS
4536D W. Addison St., Chicago 41, Illinois

MAIL TODAY

Gentlemen: Kindly send the following W110B wire:

.....½ mile on reel @ $ 9.24 ea.

.....1 mile on reel @ $18.48 ea.

FOB Chicago

Name .....
Address .....
City..... Zone.... State.....
Ordered by..... Title.....

TERMS TO RATED COMPANIES

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FOR STEAM, WATER, SUCTION, AIR, STEAM AND MORE

WHY WAIT
We have 8 to 48
RUBBER CONVEYOR BELTING

TOUGH COVERS—heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.
STRONG CARCASS—Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.
FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features: troughs easily, runs true on all idlers, gouge resistant, excellent for long and short hauls and slope installations.

Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

INQUIRE FOR SIZES NOT LISTED. ELEVATOR TRANSMISSION & V-BELTING ALSO IN STOCK.

All our belting made by the leading belting manufacturers.

Write for Free Booklet on Installation, Care & Maintenance of Conveyor Belting.

SEND US YOUR INQUIRIES FOR OTHER RUBBER PRODUCTS

CARLYLE RUBBER CO., Inc.
62 66 Park Place, New York 7, N. Y.
Phone: Digby 9-1810

FOR SALE
AT BARGAIN PRICES

CUTTING MACHINES:
Three (3) 12-AA Goodman Mining Machines, less trucks
One (1) 11-B Sullivan Mining Machine, less trucks

LOCOMOTIVES:
One (1) HM-827 General Electric, 48" Gauge
One (1) 36-A Goodman (16-ton) 48" Gauge

HOISTS:
One (1) 125 HP Single drum Ligerwood hoist complete with G. E. Thruster brake and Dial Indicator. Will spool 5,000-ft. 7/8" rope; Rope speed 400-ft. per minute.
One (1) new Roebling rope—4300-ft. 7/8"; 6x19 preformed for above.

INCLINE DRUM:
One (1) 8-ft. Tandem Incline Drum; 5 rope grooves 1 1/8".
One (1) used Roebling Rope 1 1/8"; 2200-ft. for above—used less than 2 months.

MINE CARS:
59 Enterprise Rotary Dump mine cars, 48" gauge; will hold approximately 5-tons coal without sideboards. Purchased new in 1948 from Enterprise Wheel and Car Corporation.
Two (2) Rotary dumps for above mine cars.

DRILLS:
Two (2) new #572 AC Little Giant Drills; 440V 3-phase, 60 cycle.

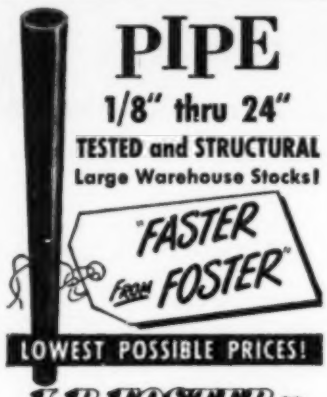
MINE SCALES:
One tipple scale, 10 tons, model 1012BMT—Bonded.

FANS:
One (1) Jeffrey Aerodyne Exhaust Fan, Serial #7479.

ROTARY CONVERTERS:
One 150 KW G. E. Rotary Converter, Type HCC-6, FORM A, complete with three 50 KVA G. E. Transformers and switchboard equipment.

CLOVER DARBY COAL CO.
CLOSPLINT, KENTUCKY
Telephone:
Evarts, Kentucky #27, Harlan County

PIPE
1/8" thru 24"
TESTED and STRUCTURAL
Large Warehouse Stocks!



LOWEST POSSIBLE PRICES!
L.B. FOSTER Co.
Pittsburgh 30, Pa. • Los Angeles 5, Cal.
Houston 2, Tex. • Chicago 4, Ill. • New York 7, N.Y.

NEW and REBUILT STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Tons 13" to 54" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

FOR SALE
New 500 Gal. Skid Mounted
STORAGE TANKS
Shell of 1/8" Steel, 2" Outlet and 12" Manhole in Top.
LEFTON INDUSTRIAL CORP.
212 Victor Street, St. Louis (4) Mo.

For Sale
18 Type 5SC-2PD
JOY SHUTTLE CARS
(Battery Type)
with batteries and chargers. Write us for any kind of mining equipment.
Industrial Machine & Electric Co.
PO Box 1107, Morgantown, W. Va.
Phone 5764

1—10 SC-2E Shuttle Car (Joy) Serial #4707
1—29U Jeffrey Cutting Machine converted to Rubber Serial #21569.
3—11BU-7E Joy Loading Machines Serial Numbers 1922, 5059 and 5035.
1—10 Ton Jeffrey Loco, W/Wheels outside frame Type MH143 Serial #7338.
1—10 Ton G. E. Loco, Type HM8306 Serial #10419.
1—8 Ton Jeffrey Loco, Type 839A Serial #8929. Cable reel.
1—G.E. 300 KW Motor-Generator Set, Automatic G.E. #709, Model #11G865, Generator #1862521.
FARLAND FUEL CO.
Morgantown, West Virginia

MOTOR GENERATORS
2—500 KW WESTG. 1200 rpm 4160/2300—275 V
2—150 KW G.E. 1200 rpm 2200—275 V
1—100 KW RIDGEWAY 1200 rpm 2200—275 V
STEEL STORAGE TANKS
18—8,000 - 10,000 & 20,000 GAL. CAP.
Located Penna - MD - FLA - TEX
THE DARIEN CORP.
60 E. 42ND ST., N. Y. 17, N.Y.

SUBSTATIONS
Rotary Converters, Mercury Arc and Selenium Rectifiers
All sizes. Furnished to requirements.
R. H. Benney Equipment Co.
5024 Montgomery Rd., Norwood 12, O.
Cincinnati Phone: MElrose 1108

1—500 KW, Motor Generator Set — Westinghouse, Serial #4079926, 2300 volt synchronous drive, 3 phase, 60 cycle, 714 HP, 600 RPM; Generator 240/275 volts DC. Complete with reduced voltage magnetic starter.
2—500 KW, Rotary Converters; 1—General Electric, Type HCC, Serial #842327, 1200 RPM, 6 ring, 275 volts DC, 1800 amps, complete with transformer and switch gear, 2300/4160 volts, 3 phase, 60 cycle. 1—Allis-Chalmers, 1200 RPM, 6 ring, Serial #113258, 275 volts DC, 1800 amps, complete with transformer and switch gear, 2300/4160 volts, 3 phase, 60 cycle.
1—200 KW, Rotary converter, Westinghouse, 1200 RPM, Serial #1555041, 6 ring, 60 cycle, 275 volts DC, 800 amps. Complete with transformer and switch gear, 2300/4160 v., 3 ph., 60 cy.
NEW direct current motors in stock—¼ HP. through 75 HP.
BENSON-WILIMZIG, INC.
1708 No. 8th St. St. Louis 6, Missouri
GArfield 4290

FOR SALE
1—Joy 11-RU Universal Coal Cutter, complete with spray nozzle
1—14-BU Joy Loader, 250 Volt D.C., permissible
2—6SC Joy Cable Reel Type Shuttle Cars, 250 Volt D.C., permissible with sideboards
2—MTB-30 Belt Conveyors, approximately 1000-foot centers
1—Lot of Wire Cable
1—Lot of Parts for Joy Equipment
Also Miscellaneous Items to operate small mine
ALBERT LUXNER
CARMICHAELS, PA.

Marion 111 M High Front Shovel 3½ yd.
500 KW-MG Set 250 and 600 V. DC—2300 V. AC.
G-D Air Compressor 500 CFM Diesel on Rubber.
Entry Tunnel or Slope Driving Machine 250 V. DC.
Myers-Whaley Loader 36" Ga. New 1948.
Jeffrey 52 H 26" Belt Conveyor 1200' long—New.
Vulcan Hoist with 200 HP Mtr 6' x 30" Drum.
Kanawa-Belknap Coal Washer 130 TPH—New 1948.
GMC 75 KW Diesel Gen. 250 V. DC. Auto. Cont.
Wanted—Drill Press 5' radial arm & 17" col.
T. L. SIMPSON, 1200 Woodbourne Av., Pittsburgh 26

Ironton
Electric Locomotives
New and used.
The Ironton Engine Company
Farmingdale, New Jersey

We have recently purchased several complete coal plants and have available an excellent stock of all types of machinery. Below is just a partial listing of our complete stock of mining, electrical and industrial equipment.

LOCOMOTIVES

1—2 ton Whitcomb, battery, 24" ga.
1—4 ton Mancha, battery, 24" ga., with Edison batteries and charging set
1—4 ton Ironton, battery, 36" ga.
2—7 ton G. E. permissible battery, 36" ga.
1—7 ton Atlas, battery, 36" ga.
3—8 ton Ironton, 36" ga.
2—8 ton General Electric, battery 36" ga.
4—10 ton Atlas, battery, 36" ga.
1—3 ton Whitcomb gas engine driven, 24" ga.
1—2½ ton Jeffrey trolley, 36" ga.
1—4½ ton Goodman trolley, 36" ga.
1—5 ton Jeffrey trolley, 36" ga.
1—6 ton Goodman trolley, 36" ga.
2—8 ton Goodman trolley, 36" ga.

COAL CRUSHERS

1—24" x 24" Jeffrey Single Roll
1—24" x 36" McNally-Pittsburg Double Roll
1—30" x 45" Jeffrey Single Roll
1—30" x 16" Williams Pulverizer
1—36" x 42" Double Roll Crusher
1—36" x 48" Jeffrey Hammermill

TUGGER & SLUSHER HOISTS

1—5 HP Brownie Room Hoist
2—5 HP Sullivan RH single drum Room Hoists
1—7½ HP Sullivan double drum Slusher Hoist
2—10 HP Sullivan 3 drum Slusher Hoist
1—25 HP Sullivan 2 drum Slusher Hoist
1—Ingersoll-Rand Mod. 6HC Air Tugger Hoist
1—Ingersoll-Rand Model EU Air Tugger Hoist
2—6½ HP Sullivan Single Drum Air Tugger Hoist, 250 Volt DC
7—6½ HP Sullivan Double Drum Slusher Hoist, 250 Volt DC
1—10 HP Double Drum Sullivan Slusher Hoist Driven by Continental Gasoline Engine

BOX CAR LOADERS

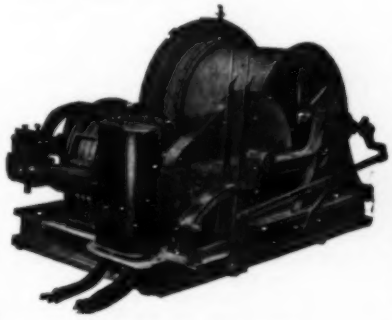
2—Ottumwa 20 HP Box car loaders
3—Maniere 22 HP Box car loaders
1—Jeffrey 20 HP Box car loader

MINING MACHINES

2—7B Sullivan super short wall coal cutters
18—CE7 Sullivan coal cutters
1—CR3 Sullivan coal cutter
1—Jeffrey 28A coal cutter
6—Goodman 112-A coal cutters
1—Sullivan CH-11 ironclad shearing machine
1—Jeffrey 29-C Arcwall coal cutter

LOADERS & CONVEYORS

1—8BU Joy loader
2—61EW Jeffrey elevating chain conveyors
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shaker conveyors
10—G-15 Goodman shaker conveyors
8—Vulcan shaker conveyors
2—Joy ladel UN-17 shaker conveyors
10—Goodman HA duckbills



ELECTRIC HOISTS

1—11 HP Vulcan #0 single drum
1—20 HP Vulcan single drum
1—22 HP Vulcan double drum
1—25 HP Vulcan single drum
1—30 HP Vulcan single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
4—100 HP Box single drum
1—112 HP Vulcan single drum
1—145 HP Vulcan single drum
2—150 HP Vulcan single drum
1—375 HP Box Single Drum Hoist, 800 FPM with 375 HP GE Slipring Motor, 575 RPM, complete with controller, grids and magnetic contact panel.
1—600 HP Box Single Drum Hoist, 25,000# Rope Pull, 900 FPM, Hydraulic Post Breaks with 600 HP Westinghouse Slipring Motor, 435 RPM, controls and magnetic contact panel.

MINE FANS & BLOWERS

2—8-H Jeffrey 42" Aerodyne Fans
1—Jeffrey 8 x 4 Fan
5—Jeffrey A61 exhaust blowers
8—Jeffrey Aerodyne midget blowers

SCALES

3—100 ton Fairbanks railroad scales
1—100 ton Howe railroad scale
1—125 ton Howe railroad scale
1—5000# Fairbanks Tipple scale with weighing basket
1—5000# Howe Tipple scale

STORAGE BINS

2—50 ton capacity steel bins

TIPPLE EQUIPMENT

1—4 deck shaker screen 32' long in 2 sections, driven by 10 HP & 25 HP motors
1—4 deck card shaker screen, 18' long, driven by 50 HP motor
1—Card rotary car dumper
1—Bucket Elevator, 36'6" centers, 18" x 8" buckets.
1—Bucket Elevator, 45' centers, 6"x4" buckets
1—Jeffrey picking table, 19' centers, 36" wide
1—Jeffrey picking table, 19'8", 36" wide
1—Jeffrey Scraper Conveyor, 88'6", 36" flights
1—Jeffrey Scraper Conveyor, 72', 30" flights
1—Jeffrey Scraper Conveyor, 67', 30" flights
1—Jeffrey Scraper Conveyor, 69'6", 28" flights
1—Link Belt Scraper Conveyor, 50', 12" flights
1—32" x 9'6" Card vibrating screen
1—4' x 6'6" Link Belt jig washer
1—Loading boom, 32'3" centers, 24" flights with 8' grizzly
1—Loading boom, 55' centers, 48" flights
1—Loading boom, 45' centers, 30" flights
2—Card self dumping mine cages
2—Card 84" bicycle sheave wheels
1—24" Belt conveyor, 13' centers
1—24" Belt conveyor, 135' centers
1—24" Belt conveyor, 66' centers
1—30" Belt conveyor, 173' centers
1—Red Devil egg loader, 16" flights
1—Ottumwa nut loader, 16" belt

PIT CARS

125—60 cu. ft. Card steel coal mine cars, 36" ga.
88—66 cu. ft. Card steel coal mine cars, 36" ga.

SHUTTLE CARS

2—Joy Shuttle Cars, Model 42D5.

RAIL

We have in stock good relaying rail, 16# to 90# also new 16# to 20# with fittings.

Send for free copy of illustrated booklet describing the famous Allen Lamp collection.

Since 1898 Dependable Reconditioned Machinery

MORSE BROS. MACHINERY CO.

2900 BRIGHTON BLVD. **EST. 1898** **DENVER 1, COLO.**

FOR SALE

15 KW HILL GENERATOR SET
Model 4R diesel — radiator cooled — 1450 RPM—32.1 HP—120/240 volts DC—3 wire—compound wound—drip-proof.

30 KW SHEPPARD GENERATOR SET
30 KW — 115 volts DC—compound wound—240 amps. — radiator cooled. Sheppard model 12 4x5 diesel — rebuilt 1953—excellent condition.

30 KW GM GENERATOR SET
3-71 2 cylinder 4½x5 diesel—radiator cooled—electric starting. Delco 440/60/3 generator—with switchgear. Skid mounted—portable.

75 KW WAUKESHA GENERATOR SET
75 KW—230 volts DC—totally enclosed, self-contained. Waukesha 6 cyl., 160 HP, 1200 RPM diesel driving 75 KW 1200 RPM G.M. marine type generator. Self-contained switchboard and radiator.

100 KW AC GENERATOR SET
Lorimer 5 cylinder 700 RPM diesel—electric starting—440/60/3 with switchgear.

100 KW GM GENERATOR SET
Model 3-268A diesel—440/60/3 AC

300 KW GM GENERATOR SET
GM 8 cyl. 6½x7 diesel model 8-268A—120/240 volts DC — 1250 amps. — 1200 rpm — with switchgear.

SUPERIOR HEAVY DUTY DIESEL
510 HP at 360 RPM—5 cylinder—14½x18—type ZDSB—non-reversing—vertical—4 cycle—cold starting—mechanical injection. Engine totally enclosed. Complete with 48" 7 groove V-belt sheave and new spare parts. For heavy duty pumping, dredge service, power generation, textile and saw mills, mining, etc. Excellent condition. For immediate delivery.

(1) 300 GPM ELECTRIC PUMP
146' head bronze centrifugal pump—driven by 20 HP 230 volt motor.

(1) 1000 GPM SUBMERSIBLE PUMP
70' head — 25 HP 440/60/3 motor — self-contained 6" pump.

AXIAL FLOW FANS — AC & DC

THE BOSTON METALS CO.
313 E. Baltimore Street
Baltimore 2, Md.
Curtis 7-5050

MOTOR GENERATOR SETS
750 KW AL Ch. 275 v. 720R-Syn. 440 v./2300
600 KW G.E. 275 v. 900R MPC-ATI 2300/4000 v.
400 KW West., 550 v. 720R-Syn.-SK 2300/4000 v.
2—300 KW West. 275 v. 1200R-Syn. 2300 v.
300 KW G.E. 275 v. 1200R-MPC-ATI 2300/4000 v.
200 KW West. 275 v. 1200R-SK-CW 2300 v.
200 KW G.E. 275 v. 1200-MPC-ATI 2300/4000 v.
200 KW Ridg. 275 v. 900R-Syn. 2300 v.
200 KW West. 275 v. 1200 R SK-Syn. 2300-4000 v.
200 KW G.E. 125 v. 1200 R MPC-ATI 2300/4000 v.
150 KW G.E. 275 v. 1200 R MPC-ATI 2300/4000 v.
150 KW G.E. 550 v. 900 vR-DLG-ATI 2300/4000 v.
100 KW Ridg. 275 v. 1200R-Syn. 2300 v.
100 KW G.E. 275 v. 1200 R. RC-ATI 2300 v.
75 KW G.E. 275 v. 1200R. MPC-Sq .Cg. 2300/440 v.
50 KW G.E. 275 v. 1200R. MPC-Sq .Cg. 2300/440 v.
35 KW G.E. 123 v. 1730 R. RC-KT 220/440 v.

ROTARY CONVERTERS
2—500 KW G.E. 275 v. HCC6-1200R. 13,200 v.
300 KW G.E. 275 v. HCC6-1200R. 2300/4000 v.
300 KW G.E. 275 v. HC12-600 R. 2200/4000
300 KW West. 275 v. 1200R. 2300/4000 v.
200 KW G.E. 275 v. HCC6-1200. 2200/4000 v.
150 KW G.E. 275 v. HCC6-1200R. 2200/4000 v.
Will rewind transformers to your specifications.

AC & DC REBUILT MOTORS—Any size
Transformers — Hoists — Compressors — Pumps — Conveyors — Loading Machines — Cutting Machines — Locomotives — Shuttle Cars, etc.

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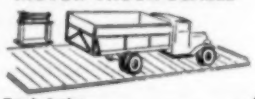

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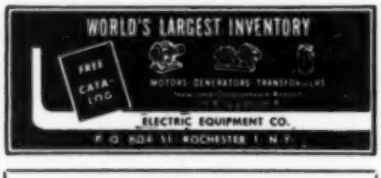

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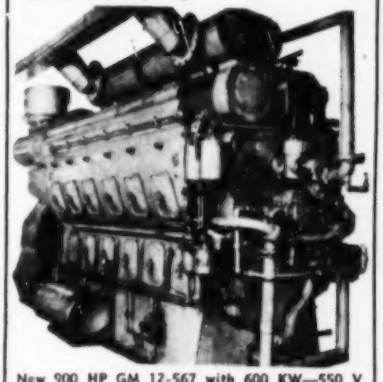

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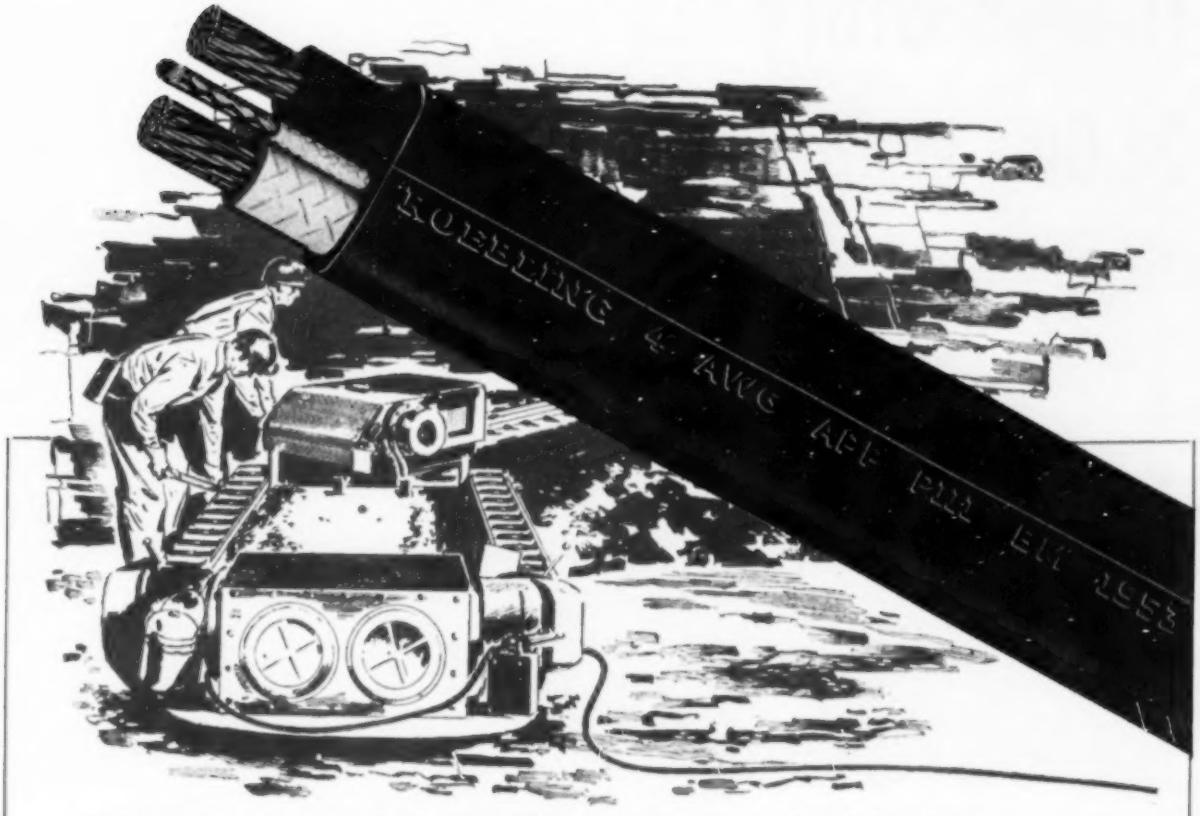

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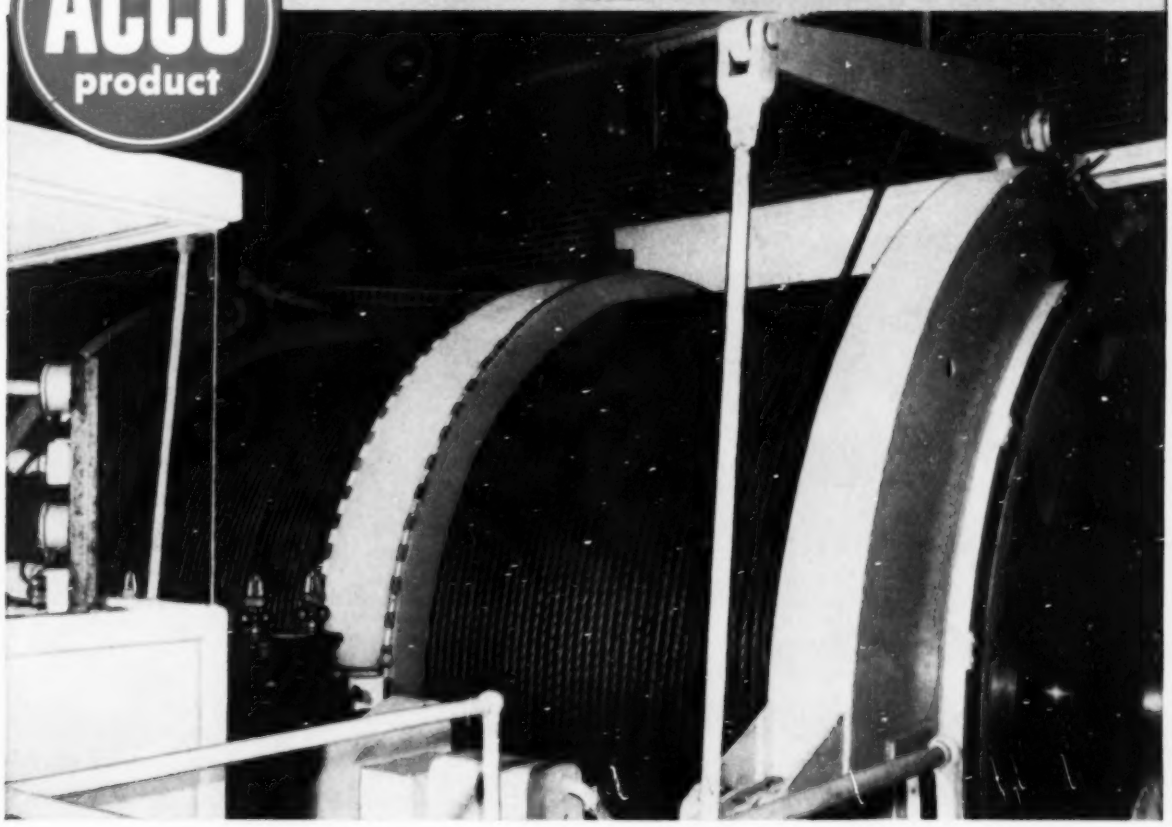

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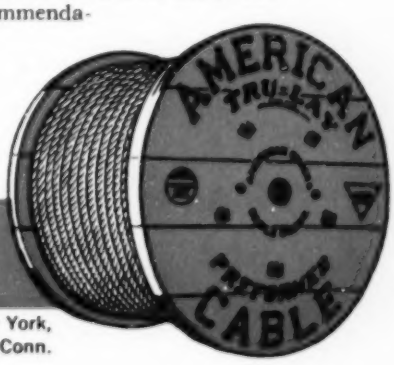
• The fine tonnage records set by TRU-LAY mine shaft ropes are due to their particular construction.

For many years AMERICAN CABLE engineers have checked carefully the service life of various constructions of wire rope. They found repeatedly that there is one grade of rope with the exact combination needed for highest strength and resistance to bending fatigue and crushing on the drum. Their experience records show consistently longer life which means lower operating costs.

Before you order your next shaft rope, or wire rope for any other purpose, ask your AMERICAN CABLE distributor to tell you the advantages of TRU-LAY Preformed improved plow steel, the rope identified by the green strand. Let him recommend the correct, long-life construction for your equipment. It will save you money.

Write our Wilkes-Barre office for **DH-128-A** "Wire Rope Recommendations for Mining Industries."



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LINK-BELT Heavy-Media Preparation Plant

solves problem of cleaning No. 3 Pocahontas seam

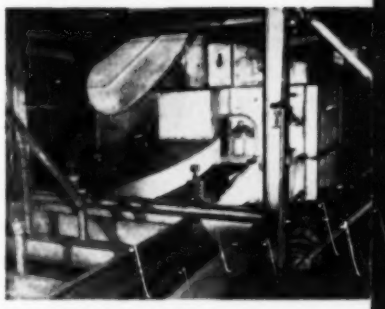
PICTURED here is the Link-Belt Heavy-Media Preparation Plant used by Pocahontas Fuel Company Incorporated to uniformly clean Pocahontas No. 3 Seam coal at their Itmann mine in Wyoming County, West Va.

The world famous by-product coal of the Pocahontas No. 3 Seam does, in some areas, contain impurities and economical cleaning presents a problem.

With the installation of the Link-Belt Heavy-Media Preparation plant, Pocahontas Fuel Company Incorporated is producing 700 tons per hour of a uniformly high grade coal from this seam at their Itmann mine.

Link-Belt Multi-Louvre Dryers, which efficiently remove moisture, participate in the cleaning operation. Five clean, dry, accurate sizes are individually loaded or blended—and refuse is disposed of by the Link-Belt handling system.

This Link-Belt-engineered preparation plant is another instance of Link-Belt's continuing efforts to aid the mining industry in solving challenging problems. It's also an example of how Link-Belt offers one dependable source . . . one undivided responsibility for a complete modern coal preparation plant.



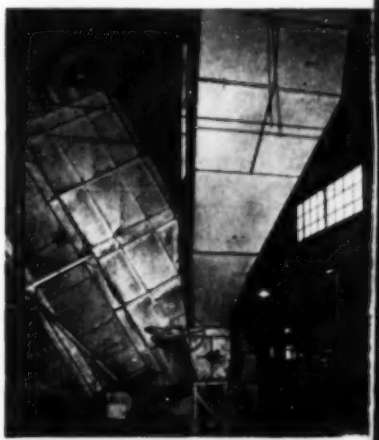
Link-Belt Float-Sink Concentrator permits high or low specific gravity separation. High accuracy is achieved even when amount of impurities in feed fluctuates. Cleans larger sizes, reducing manual picking.

LINK-BELT engineered, erected and initiated successful operation of this complete Heavy-Media plant

Included in the equipment supplied by Link-Belt for this Itmann plant, are the following major components manufactured by Link-Belt:

- 3 Float-Sink Concentrators
- 3 Media Thickeners
- 4 Multi-Louvre Dryers
- Rotary Car Dumper and Mine Car Handling and Dumping Equipment
- Shaker Screens
- Apron Type Loading Booms
- All Conveying and Power Transmisssion Equipment

Traveling louvres cause constant agitation of coal as it moves through the Multi-Louvre Dryer. Mixing plus constant aeration promotes fast, gentle, uniform drying. Accurate control is maintained at low temperatures.



LINK-BELT

COAL PREPARATION AND HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 19, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa).

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